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THE
ZOOLOGICAL RECORD
FOR 1870;
BEING
VOLUME SEVENTH
OF THE
RECORD OF ZOOLOGICAL LITERATURE.

EDITED BY
ALFRED NEWTON, M.A., F.R.S.,
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OF CAMBRIDGE, F.L.S., V.P.Z.S., ETC.

Explorate solum: sic fit via certior ultra.

LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.
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ALERE FLAMMAN.



P R E F A C E.

DR. GÜNTHER having last year put into execution his long-meditated intention of resigning to me the editorship of 'THE RECORD OF ZOOLOGICAL LITERATURE,' and its publisher being unwilling to continue an unprofitable undertaking, it fell to me, and to the friends I consulted, to devise some plan whereby that work, which had been warmly encouraged by such zoologists as were acquainted with it, should be carried on.

The British Association for the Advancement of Science having again repeated its grant of £100 towards the publication of a Zoological Record, I was at first in hopes that the Ray Society would help the cause, and I accordingly addressed a proposal to that effect to the Society's Council. This proposal was declined; and, however much I may regret the fact, I cannot, when regarding the large number of works to the publication of which the Society is pledged, complain of the decision, made known to me as it was in most courteous and complimentary terms.

No further hope of aid existing in this quarter, a meeting of the Zoological Record Committee, appointed by the British Association, was summoned on the 11th of January, 1871; and, after due deliberation, it was resolved that its members

should form themselves into a ZOOLOGICAL RECORD ASSOCIATION, and should invite the cooperation of zoologists generally to attain the desired object, the principle of the Association being similar to that of a small society of gentlemen who had by its means successfully carried on for more than a dozen years a scientific journal in which they were interested.

The resolution of the Committee was favourably received by the zoological public; and when, on the 16th of March, 1871, a general meeting of the new Association was held to settle its fundamental rules, it was found to consist of nearly *sixty* members, among whom were most of the leaders in every branch of zoology throughout the United Kingdom.

Thus much being said by way of explanation, I have to add a few words respecting the present volume. Deprived by one cause or another of the cooperation of some of my predecessor's most valued contributors, I have had to supply their place by new Recorders; and the result has been a much larger infusion of fresh blood into the staff of the work than had occurred since it was begun. Some of these gentlemen have wished me to say a word on behalf of their inexperience when succeeding Recorders of proved capacity; but this seems to me unnecessary. Their work speaks best for itself; and if any deficiency of execution through want of practice be detected, it may be thought to be more than counterbalanced by the introduction of new, and perhaps improved, modes of treatment.

The late continental war, as might be expected, has seriously deranged the publication of many scientific journals, and in consequence the zoological literature of 1870 is considerably

less than that of preceding years. Nevertheless the reduced bulk of the present volume must not be altogether ascribed to that cause, but is in a great measure owing to the increased care of some of the Recorders to condense their respective contributions. I have to repeat the regrets before expressed by my predecessor, that a large number of journals which have, or should have, appeared in the past year did not reach this country in time for their contents to be noticed here, while the precise pagination of very many papers which are recorded cannot be given, owing to the fact of their being only known to the Recorders in the form of separate copies which withhold this very necessary information.

The want of uniformity in the mode of citing the numerous journals to which reference is made, though hitherto unavoidable, has caused considerable inconvenience to those who use this work. Accordingly steps were taken whereby a more regular system should be adopted, and, thanks to the Recorders, most of whom readily followed the suggestion, this has been partially done. Next year it may be hoped that the exceptions will be fewer still. Since, however, to save space, more concise forms of citation than are common have here been used, an alphabetical List of the abbreviations, showing also the full title, has been introduced, the advantage of which to readers will be obvious. Another novel feature of the present volume is an Index to the Genera and Subgenera recorded as new; and the utility of this addition will, I think, be generally admitted.

In conclusion, I have to acknowledge the liberality of the Zoological Society of London, which, by its Council, has placed at the disposal of the ZOOLOGICAL RECORD ASSOCIATION one year's

interest of the Davis Bequest, amounting to £58 11s. 10d.; and it is with peculiar pleasure that I have to mention another grant of £100 from the British Association for the Advancement of Science towards the expenses of the volume for 1871. I must also record the great personal obligation I am under to my friend Mr. GEORGE ROBERT CROTCH, late Assistant-Librarian to the University of Cambridge, who has rendered this volume very important assistance by acting as Sub-Editor, and to that end most kindly postponed a contemplated voyage round the world.

A. N.

Magdalene College, Cambridge,
20 October, 1871.

*** Communications, papers, and memoirs intended for this work should be addressed *solely* to "THE EDITOR of the Zoological Record, care of Mr. Van Voorst, 1 Paternoster Row, London." It is earnestly requested that in the case of separately-printed copies of papers so forwarded the *original pagination* be indicated.

LIST OF THE
PRINCIPAL ABBREVIATED TITLES OF JOURNALS
QUOTED IN THIS VOLUME.

- Abh. Ak. Berl.*—Abhandlungen der k. Akademie der Wissenschaften zu Berlin.
- Abh. Ges. Görl.*—Abhandlungen der naturforschenden Gesellschaft zu Görlitz.
- Abh. senck. Ges.*—Abhandlungen herausgegeben von der senckenbergischen naturforschenden Gesellschaft.
- Abh. Ver. Brem.*—Abhandlungen herausgegeben von dem naturwissenschaftlichen Vereine zu Bremen.
- Act. Lund.*—Acta Universitatis Lundensis.
- Am. Ent.*—American Entomologist.
- Am. Ent. Bot.*—American Entomologist and Botanist.
- Am. J. Conch.*—American Journal of Conchology.
- Am. J. Sc.*—American Journal of Science and Art.
- Am. Nat.*—American Naturalist.
- An. Mus. B. Aires.*—Anales del Museo publico de Buenos Aires.
- Ann. E. Belg.*—Annales de la Société entomologique de Belgique.
- Ann. Lyc. N. York.*—Annals of the Lyceum of Natural History of New York.
- Ann. Mal.*—Annales de Malacologie.
- Ann. Mal. Belg.*—Annales de la Société malacologique de Belgique.
- Ann. Mus. Genova.*—Annali del museo civico di storia naturale di Genova.
- Ann. Mus. Nap.*—Annuario del Museo zoologico della R. Università di Napoli.
- Ann. N. H. (4).*—Annals and Magazine of Natural History. Fourth Series.
- Ann. Sc. Nat. (5).*—Annales des Sciences Naturelles. Cinquième Série.
- Ann. Soc. Ent. Fr.*—Annales de la Société entomologique de France.
- Ann. Soc. L. Lyon.*—Annales de la Société linnéenne de Lyon.
- Ann. Soc. Mod.*—Annuario della Società dei Naturalisti in Modena.
- Arb. vers. Jena.*—Arbeiten der landwirth-versuchenden Gesellschaft in Jena.
- Arch. Anat. Phys.*—Archiv für Anatomie, Physiologie und wissenschaftliche Medicin.
- Arch. durchf. Böhm.*—Archiv für die naturwissenschaftliche Landesdurchforschung von Böhmen.
- Arch. f. Nat.*—Archiv für Naturgeschichte.
- Arch. mikr. Anat.*—Archiv für mikroskopische Anatomie.
- Arch. Nat. Livl.*—Archiv für die Naturkunde Liv- Ehst- und Kurlands.

Arch. Néerl.—Archives néerlandaises.

Arch. path. Anat.—Archiv für pathologische Anatomie und Physiologie.

Arch. p. Zool.—Archivio per la Zoologia, l'Anatomia e la Fisiologia.

Atti Acc. Tor.—Atti dell' Accademia di scienze di Torino.

Atti Soc. Ital.—Atti della Società Italiana di scienze naturali.

Ber. Ges. Bamb.—Bericht der naturforschenden Gesellschaft in Bamberg.

Ber. senck. Ges.—Bericht der senckenbergischen naturforschenden Gesellschaft.

Ber. St. Gall. Ges.—Bericht über die Thätigkeit der St. Gallischen naturwissenschaftlichen Gesellschaft.

Ber. Ver. Augsburg.—Bericht des naturhistorischen Vereins in Augsburg.

B. E. Z.—Berliner entomologische Zeitschrift.

Bibl. Univ.—Bibliothèque universelle.

Bl. Niederöst.—Blätter des Vereins für Landeskunde in Niederösterreich.

Bull. Ac. Belg.—Bulletins de l'Académie royale des Sciences de Belgique.

Bull. Ent. Ital.—Bullettino della Società Entomologica Italiana.

Bull. Mal.—Bullettino Malacologico.

Bull. Mosc.—Bulletin de la Société impériale des Naturalistes de Moscou.

Bull. Pétersb.—Bulletin de la classe physico-mathématique de l'Académie de St.-Petersbourg.

Bull. Soc. Acclim.—Bulletin de la Société impériale d'Acclimatation.

Bull. Soc. Colm.—Bulletin de la Société d'histoire naturelle de Colmar.

Bull. Soc. Moselle.—Bulletin de la Société d'histoire naturelle du département de la Moselle.

Bull. Soc. Strasb.—Bulletin de la Société des sciences naturelles de Strasbourg.

Canad. Ent.—Canadian Entomologist.

Canad. Nat.—Canadian Naturalist and Geologist.

CB. Ver. Regensb.—Correspondenz-Blatt des zoologisch-mineralogischen Vereins in Regensburg.

CB. Ver. Riga.—Correspondenz-Blatt des naturforschenden Vereins zu Riga.

Corr. Sc.—Corrispondenza scientifica.

C. R.—Comptes Rendus de l'Académie des Sciences.

Dan. Selsk. Skr.—K. Danske Videnskabernes Selskabs Skrifter.

Denk. Ak. Wien.—Denkschriften der k. Akademie der Wissenschaften zu Wien.

Ent.—The Entomologist.

Ent. Ann.—Entomologist's Annual.

Ent. M. M.—Entomologist's Monthly Magazine.

Förh. Selsk. Chr.—Förhandlingar i Videnskaps-Selskabet i Christiania.

Förh. Sk. Naturf.—Forhandlingar ved de Skandinaviske Naturforskeres Møde.

Geogr. Mitth.—Mittheilungen aus Justus Perthes geographischer Anstalt.

Hor. Ent. Ross.—Horæ Societatis Entomologicæ Rossicæ.

Ibis.—The Ibis.

- J. Anat. Phys.*—Journal of Anatomy and Physiology.
J. A. S. B.—Journal of the Asiatic Society of Bengal.
JB. Ges. Hann.—Jahresbericht der naturforschenden Gesellschaft zu Hannover.
JB. Ges. Krak.—Jahresbericht der Gelehrten Gesellschaft zu Krakau.
JB. schles. Ges.—Jahresbericht der schlesischen Gesellschaft für vaterländische Kultur.
JB. Ver. Nass.—Jahrbücher des Vereins für Naturkunde im Herzogthum Nassau.
JB. Ver. Naturk. Fulda.—Jahresbericht des Vereins für Naturkunde in Fulda.
J. de Conch.—Journal de Conchyliologie.
J. de l'Anat.—Journal de l'Anatomie et de la Physiologie.
J. Dubl. Geol. Soc.—Journal of the Dublin Geological Society.
Jen. Z. Nat.—Jenaische Zeitschrift für Medicin und Naturwissenschaften.
J. f. O.—Journal für Ornithologie.
JH. Ver. Württ.—Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg.
Jorn. Sc. Lisb.—Jornal de Sciencias da Academia Real de Lisboa.
J. Quek. Micr. Club.—Journal of the Quekett Microscopical Club.
J. R. Dubl. Soc.—Journal of the Royal Dublin Society.
L'Ab.—L'Abeille.
Mal. Bl.—Malakozoologische Blätter.
MB. Ak. Berl.—Monatsberichte der k. Akademie der Wissenschaften zu Berlin.
Mel. Biol.—Mélanges biologiques tirés du Bulletin de l'Académie impériale des Sciences de St.-Petersbourg.
Mém. Ac. Belg.—Mémoires de l'Académie royale des Sciences de Belgique.
Mem. Ac. Bologn.—Memorie dell' Accademia di scienze dell' Istituto di Bologna.
Mem. Ac. Madr.—Memorias de la Real Academia de Ciencias de Madrid.
Mém. cour. Ac. Belg.—Mémoires couronnés publiés par l'Académie Royale de Belgique.
Mém. Liège.—Mémoires de la Société royale des Sciences de Liège.
Mém. Pétersb.—Mémoires de l'Académie impériale des Sciences de St.-Petersbourg.
Mém. Soc. Cherb.—Mémoires de la Société des Sciences naturelles de Cherbours.
Mém. Soc. Phys. Genève.—Mémoires de la Société de physique et d'histoire naturelle de Genève.
Mém. Soc. Strasb.—Mémoires de la Société des Sciences naturelles de Strasbourg.
Mith. schw. ent. Ges.—Mittheilungen der schweizerischen entomologischen Gesellschaft.
Mith. Ver. Steierm.—Mittheilungen des naturwissenschaftlichen Vereins für Steiermark.
Mith. voigtl. Ver.—Mittheilungen des voigtländischen Vereins für Naturkunde.
M. Micr. J.—Monthly Microscopical Journal.
Nachr. Malak. Ges.—Nachrichtenblatt der deutschen malakozoologischen Gesellschaft.

N. Arch. Mus.—Nouvelles Archives du Muséum d'Histoire Naturelle.

Nat. Tids.—Naturhistorisk Tidsskrift.

N. Mém. Mosc.—Nouveaux Mémoires de la Société impériale des Naturalistes de Moscou.

Nunq. Ot.—Nunquam Otiosus.

Öfv. Fin. Soc.—Öfversigt af Finska Vetenskaps-Societetens Förhandlingar.

Öfv. Sv. Ak.—Öfversigt af K. Svenska Vetenskaps Akademiens Förhandlingar.

Overs. Dan. Selsk.—Oversigt over det K. Danske Videnskabernes Selskabs Forhandlingar.

P. Ac. Philad.—Proceedings of the Academy of Natural Sciences of Philadelphia.

Pal. Soc.—Publications of the Palæontographical Society.

P. Am. Ac.—Proceedings of the American Academy of Arts and Sciences.

P. Am. Phil. Soc.—Proceedings of the American Philosophical Society.

P. Antiq. Scot.—Proceedings of the Society of Antiquaries of Scotland.

P. As. Soc. Beng.—Proceedings of the Asiatic Society of Bengal.

P. Berw. Nat. Club.—Proceedings of the Berwickshire Naturalists' Club.

P. Bost. Soc.—Proceedings of the Boston Society of Natural History.

P. Cal. Ac.—Proceedings of the California Academy of Natural Science.

P. Ess. Inst.—Proceedings of the Essex Institute.

Pet. Nouv.—Petites Nouvelles Entomologiques.

Phil. Tr.—Philosophical Transactions of the Royal Society.

P. Liverp. Soc.—Proceedings of the Literary and Philosophical Society of Liverpool.

P. L. S.—Journal of Proceedings of the Linnean Society.

Pop. Sc. Rev.—Popular Science Review.

P. Phys. Soc. Edinb.—Proceedings of the Royal Physical Society of Edinburgh.

Pr. E. Soc.—Proceedings of the Entomological Society of London.

P. R. Irish Ac.—Proceedings of the Royal Irish Academy.

P. R. Soc.—Proceedings of the Royal Society.

P. R. Soc. Edinb.—Proceedings of the Royal Society of Edinburgh.

P. R. Soc. Maur.—Proceedings of the Royal Society of Arts and Sciences of Mauritius.

P. R. Soc. Tasm.—Monthly Notices and Proceedings of the Royal Society of Tasmania.

P. Z. S.—Proceedings of the Zoological Society.

Q. J. Micr. Sc.—Quarterly Journal of Microscopical Science.

Rep. Br. Ass.—Report of the British Association for the Advancement of Science.

Rep. Comm. Agr.—Report of the Commission of Agriculture.

Rep. Ins. Miss.—Annual Report on the Noxious Insects of the State of Missouri.

R. Z.—Revue et Magasin de Zoologie pure et appliquée.

SB. Ak. Wien.—Sitzungsberichte der Akademie der Wissenschaften zu Wien.

SB. Ges. Isis.—Sitzungsberichte der naturwissenschaftliche Gesellschaft "Isis."

SB. Nat. Fr.—Sitzungsbericht der Gesellschaft naturforschender Freunde zu Berlin.

SB. oberhess. Ges.—Sitzungsberichte der oberhessischen Gesellschaft für Natur- und Heilkunde.

Sc. Goss.—Science Gossip.

Schr. Ges. Königsb.—Schriften der K. physikalisch-ökonomischen Gesellschaft zu Königsberg.

S. E. Z.—Stettiner entomologische Zeitung.

Stud.—Student and Intellectual Observer.

Sv. Ak. Handl.—K. Svenska Vetenskaps Akademiens Handlingar.

Tijd. Ent.—Tijdschrift voor Entomologie.

Tijd. Nederl. Ind.—Natuurkundig Tijdschrift voor Nederlandsch Indië.

Tr. Am. Ent. Soc.—Transactions of the American Entomological Society.

Tr. Conn. Ac.—Transactions of the Connecticut Academy of Sciences.

Tr. E. Soc.—Transactions of the Entomological Society of London.

Tr. L. S.—Transactions of the Linnean Society.

Tr. Malv. Club.—Transactions of the Malvern Naturalists' Field Club.

Tr. North. Durh.—Natural History Transactions of Northumberland and Durham.

Tr. Norw. Soc.—Transactions of the Norfolk and Norwich Naturalists' Society.

Tr. N. Z. Inst.—Transactions and Proceedings of the New-Zealand Institute.

Tr. R. Irish Ac.—Transactions of the Royal Irish Academy.

Tr. R. Soc. Edinb.—Transactions of the Royal Society of Edinburgh.

Tr. Woolh. Club.—Transactions of the Woolhope Naturalists' Field Club.

Tr. Z. S.—Transactions of the Zoological Society.

Verh. Akad. Amst.—Verhandelingen d. k. Akademie van wetenschappen.

Verh. Ges. Würzb.—Verhandlungen der physisch-medicinischen Gesellschaft zu Würzburg.

Verh. L.-C. Ak.—Verhandlungen der k. L.-C. deutschen Akademie der Naturforscher.

Verh. Ver. Brünn.—Verhandlungen des naturforschenden Vereins.

Verh. Ver. Heidelb.—Verhandlungen des naturhistorisch-medizinischen Vereins.

Verh. Ver. Rheinfl.—Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westphalens.

Verh. z.-b. Wien.—Verhandlungen der zoologisch-botanischen Gesellschaft in Wien.

Versl. Akad. Amst.—Verslagen en mededeelingen d. k. Akademie van wetenschappen.

Vid. Medd.—Videnskabelige Meddelelser fra den Naturhistoriske Forening.

Z. Ferd.—Zeitschrift des Ferdinandæums.

Z. ges. Naturw.—Zeitschrift für die gesammten Naturwissenschaften.

Zool. Gart.—Zoologischer Garten.

Zool. Rec.—Record of Zoological Literature.

Zool. s. s.—The Zoologist. Second Series.

Z. wiss. Zool.—Zeitschrift für wissenschaftliche Zoologie.

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ZOOLOGICAL RECORD

FOR 1870.

MAMMALIA

BY

ALBERT GÜNTHER, M.A., M.D., PH.D., F.R.S.

GENERAL NOTES AND FAUNÆ.

Prof. BURMEISTER gives a list of the Mammalia in the Museum at Buenos Ayres. An. Mus. Buen. Aires, 1869, pp. 446-465. One hundred and eighty-seven species.

Dr. J. L. SOUBEIRAN, during the siege of Paris in 1870, drew up an account of the aliments derived by more or less civilized nations from the animal kingdom. The paper is entitled "Curiosités de l'Alimentation." Bull. Acclim. 1870, pp. 714-734.

Arctic Region. "Anteckningar om djurlifvet i Ishafvet mellan Spetsbergen och Grönland" [Remarks on animal life in the Glacial Ocean between Spitzbergen and Greenland], by A. QUENNERSTEDT, Svensk. Vet. Ak. Handl. vii. 1868, pp. 35, 3 plates. The mammals to which special attention was paid are species of *Phoca*.

Siberia. Under the title "Neue Untersuchungen über die in den altaischen Höhlen aufgefundenen Säugethierreste, ein Beitrag zur quaternären Fauna des Russischen Reiches," Prof. F. BRANDT gives an account of the remains of recent species found in a fossil condition in caves of the Altai Mountains. Mém. Biol. vii. 1870, pp. 359-438; Bull. Ac. Sc. St. Pétersb. xv. pp. 147-202. These researches are very important for our knowledge of the distribution of animals, and refer to the 1870. [VOL. VII.]

B

following species :—*Vesperugo borealis*, *Plecotus auritus*, *Sorex vulgaris*, *Talpa europæa*, *Felis tigris*, *F. uncia*, *F. lynx*, (*Hyæna spelæa*), *Canis lupus*, *C. vulpes*, *C. corsac*, *Ursus arctos*, *Meles taurus*, *Mustela zibellina*, *M. putorius*, *M. sibirica*, *Tamias striatus*, *Pteromys volans*, *Arctomys bobac*, *Spermophilus evermanni*, *Castor fiber*, *Cricetus vulgaris*, *Arvicola amphibius*, *H. saxatilis*, *Myospalax lazzmanni*, *Lepus variabilis*, *Cervus alces*, (*Cervus euryceros*), *C. elaphus*, *C. capreolus*, *Ovis domestica*, *Bos bonasus*, *B. taurus*, *Equus caballus*, *Sus scrofa*, (*Rhinoceros tichorhinus*), (*Elephas primigenius*).

Switzerland. MM. DU PLESSIS and COMBE have given a list of 34 Mammals found in the district of Orbe. Bull. Soc. Vaudoise Sc. Nat. x. pp. 249–256.

Sardinia. A. CARUCCIO gives a list of 36 Mammalia inhabiting this island. Att. Soc. Ital. Sc. Nat. xii. 1870, pp. 554–562.

Modena. BONIZZI gives a list of 41 species of Mammals (including some extinct kinds) found in the district of Modena. Ann. Soc. Nat. Modena, v. 1870, pp. 113–143.

North America. Mr. R. BROWN read a paper on “The Mammalian Fauna of North-west America” at the meeting of the British Association for the Advancement of Science, in 1869. He divides the country to the west of the Rocky Mountains, north of California, into several regions, for which we refer the student to the abstract published in the Reports of the Association, 1870, pp. 109–111.

Nova Scotia. Dr. GILPIN continues his observations on the Mammalian Fauna. Proc. & Trans. N. Scot. Inst. Nat. Sc. ii. 3, 1870, pp. 8–18. This part treats of *Ursus americanus*, *Sciurus hudsonius*, *Pteromys hudsonius*, *Tamias striatus*, and *Arctomys monax*.

United States. J. A. ALLEN enumerates 48 species in “Notes on the Mammals of Iowa.” Proc. Bost. Soc. Nat. Hist. xiii. 1870, pp. 178–194.

China. Mr. SWINHÖE has some entertaining and instructive “Zoological notes of a journey from Canton to Peking and Kalgan,” P. Z. S. 1870, pp. 427–451. The paper abounds in ornithological observations, but several Mammals are also mentioned, as *Elaphurus davidianus*, *Spermolegus evermanni*, *Lepus tolai*, and *Erinaceus dealbatus* (sp. n.).

In a second paper the same author gives a “Catalogue of the Mammals of China (south of the river Yangtsze) and of the Island of Formosa,” *ibid.* pp. 615–653. The number of species amounts to 82, and copious notes on most of them are given.

Hainan. Mr. SWINHÖE enumerates, and makes notes on, 21 species of mammals from this island, P. Z. S. 1870, pp. 224–239, besides the Deer, of which he treated in a previous paper (see Zool. Rec. vi. p. 22), and some others not observed by himself, but mentioned in a Chinese work.

Eastern Thibet. A. MILNE-EDWARDS notices several new Mammals, viz. two Monkeys, three Insectivores, a new genus of Bears, and a *Pteromys*. Compt. Rend. 1870, lxx. pp. 341-342.

Egypt. "Animaux domestiqués par les anciens Égyptiens," by A. P. PICHOT, Bull. Acclim. 1870, pp. 97-103.—"Sur la domestication de quelques espèces d'antilopes au temps de l'ancien empire égyptien," by F. LENORMANT, Compt. Rend. 1870, lxx. pp. 413-416.—"Note sur le cheval au temps du nouvel empire égyptien," by the same, *l. c.* pp. 163-167.

Abyssinia. Mr. W. T. BLANFORD, the geologist of the British expedition in 1867-68, has published his 'Observations on the Geology and Zoology of Abyssinia,' London: 1870, 8vo, pp. 487, plates. The work is divided into three parts:—1. Personal Narrative, pp. 1-139. 2. Geology, pp. 143-203. 3. Zoology, pp. 207-477. In the introduction to the last part he reviews the previous literature on the subject, and divides the country hypsometrically into four regions, adding lists of the animals with indication of the altitudes at which he has observed them. In the account of the Mammalia (pp. 222-284) 37 species are referred to, the more important of which will be mentioned subsequently.

Prof. PETERS gives a list of 14 Mammals collected by Dr. Schimper in Abyssinia, with some notes on their habits and distribution. SB. nat. Fr. Berl. (1869) 1870, pp. 7-8.

West Africa. Prof. PETERS enumerates 14 Bats and 12 Rodents from the Portuguese possessions in West Africa. Jorn. Lisb. 1870, pp. 123-127.

South America. JIMENEZ DE LA ESPADA, a member of the Spanish expedition to explore the natural productions and physical conditions of South America, has published in a separate form (from the 'Boletín revista de la Universidad de Madrid'), "Algunos datos nuevos ó curiosos acerca de la Fauna del alto Amazonas (Mamíferos)," Madrid: 1870, 8vo, pp. 27. In this pamphlet he makes some general remarks on the objects of the expedition, describes two new Monkeys, and treats of the sucking-cups on the wings of *Thyroptera*.

New Zealand. A "List of the bones of Seals and Whales in the Colonial Museum, Wellington, New Zealand," drawn up by Dr. JAMES HECTOR, is published, with notes, by Dr. GRAY, in Ann. & Mag. N. H. 1870, v. pp. 220-224. It refers to two Seals and five Cetaceans.

ANATOMY AND PHYSIOLOGY.

1. *Separate Works.*

FLOWER, W. H. An introduction to the Osteology of the Mammalia. London: 1870, 16mo, pp. 344, with numerous woodcuts.

This work contains the substance of a course of lectures delivered in 1870 by the author as Hunterian Professor at the Royal College of Surgeons of England, and forms a student's hand-book. In carrying out his plan the author has been most successful, the materials being worked out in a uniformly conscientious manner, so that the beginner has no difficulty in becoming acquainted with the principal facts, without being compelled to select them from a mass of details which are better reserved for a future course of study. Yet we should give an erroneous impression of this work by representing that it contains nothing but elementary matter. Beside being a most useful guide to the elements of Mammalian Osteology, it treats of the modifications of structure of all the more important types, and will be consulted with advantage by the advanced student. A useful index is appended.

GEGENBAUR, C. Grundzüge der vergleichenden Anatomie. *Second edition.* Leipzig: 1870, 8vo, pp. 892, with 319 woodcuts.

HASSE, C. Anatomische Studien, herausgegeben von —. Erstes Heft. Leipzig: 1870, 8vo, pp. 188.

This contains, beside other memoirs, one on the comparative anatomy of the vertebral column, especially of Man and Mammals, by C. HASSE and W. SCHWARCK.

ROLLESTON, G. Forms of Animal Life. Being outlines of zoological classification based upon anatomical investigation, and illustrated by descriptions of specimens and of figures. Oxford: 1870, 8vo, pp. 268.

SCHMIDT, M. Zoologische Klinik. Handbuch der vergleichenden Pathologie und pathologischen Anatomie der Säugethiere und Vögel. Bd. 1. Abtheil. 1. Die Krankheiten der Affen. [The diseases of Monkeys.] Berlin: 1870, 8vo, pp. 166.

2. Papers published in Journals.

BOETTCHER, A. Ueber Entwicklung und Bau des Gehörlabyrinths nach Untersuchungen an Säugethieren. Part 1. Act. Ac. Leop. Nat. Cur. xxxv. 1869, pp. 203, 12 plates. [On the development and structure of the labyrinth, from researches in Mammals.]

CLELAND, J. The peritoneum of the human subject illustrated by that of the Wombat. Journ. Anat. & Physiol. iv. 1870, pp. 197–199, plate.

COUES, E. Antero-posterior symmetry, with special reference to the muscles of the limbs. Medical Record, New York, June to September, 1870.

- COUES, E. Notice of a cyclopean pig. Proc. Bost. Soc. Nat. Hist. xiii. 1869, pp. 93-101, with figure of skull.
- FLOWER, W. H. On the correspondence between the parts composing the shoulder and the pelvic girdle of the Mammalia. Journ. Anat. & Physiol. iv. 1870, pp. 239-245.
- GULLIVER, G. On the size of the red corpuscles of the blood of *Moschus*, *Tragulus*, *Orycteropus*, *Ailurus*, and some other Mammalia, with historical notes. P. Z. S. 1870, pp. 92-99.
- HOFFMANN, C. K., & WEYENBERGH, H. Die Osteologie und Myologie von *Sciurus vulgaris*, verglichen mit der Anatomie der Lemuriden und des *Chiromys*, und über die Stellung des letzteren im natürlichen Systeme. Verh. Holl. Maatsch. Haarlem, 1870, pp. 136, 4 plates.
- HUMPHRY, G. M. A comparison of the shoulder-bones and muscles with the pelvic bones and muscles. Journ. Anat. & Physiol. v. 1870, pp. 67-88, plate.
- HYRTL, C. J. Eine Spiralklappe in der Pfortader der Nagethiere. SB. Ak. Wien, lxi. 1870, pp. 27-32, plate. [On a spiral valve in the *vena portæ* of Rodents.]
- JÄGER, G. Ueber das Längenwachsthum der Knochen. Jena. Zeitschr. v. 1870, pp. 1-42. [On the longitudinal growth of bones.]
- MACALISTER, A. On the myology of the Wombat (*Phascolomys wombat*) and the Tasmanian Devil (*Sarcophilus ursinus*). Ann. & Mag. N. H. 1870, v. pp. 153-173.
- MURIE, J. On some abnormal and diseased dental conditions in animals. No. II. Trans. Odontol. Soc. Great Brit. ii. 1870, pp. 257-297, with a plate (mouth of *Hippopotamus*) and woodcuts.
For the first part see Zool. Record, vi. p. 10.
- . On a case of variation in the horns of a Panolian Deer. P. Z. S. 1870, pp. 611-614, woodcut.
A case of malformation caused by injury to the frontal base.
- NUHN, A. Ueber die Magenformen der Wirbelthiere. Archiv Anat. Phys. 1870, pp. 333-345, 2 plates. [On the forms of stomach in Vertebrates.]
- STIEDA, L. Studien über das centrale Nervensystem der Wirbelthiere. Zeitschr. wiss. Zool. xxi. 1870, pp. 273-456, Taf. 17-20.
- WEYENBERGH, H. See HOFFMANN, C. K.
- WINIWARTER, A. VON. Untersuchungen über die Gehörsschnecke der Säugethiere. SB. Ak. Wien, lxi. 1870, pp. 683-714, plate. [Researches on the cochlea of Mammals.]

WOOD, J. On a group of varieties of the muscles of the human neck, shoulder, and chest, with their transitional forms and homologies in the Mammalia. Phil. Trans. vol. clx. 1870, pp. 83-116, 3 plates.

FRIEDLowsKY describes a malformation of a hand of *Macacus cynomolgus* with only four fingers. Verh. Z.-B. Ges. Wien, 1870, pp. 1017-1026, Taf. 15. figs. 3-5.

The same author has observed a lobed gall-bladder in a Cat and a *Cercopithecus sabæus*. Ibid. pp. 1027-1032, Taf. 15. figs. 1, 2.

QUADRUMANA.

GRAY, J. E. Catalogue of Monkeys, Lemurs, and Fruit-eating Bats in the collection of the British Museum. London: 1870, 8vo, pp. 137, woodcuts.

This work contains diagnoses and the synonymy of the species which are in the British-Museum collection, or which the author knows from autopsy. References are also given to all the remaining species described from other collections; and therefore the work must be consulted by all students of these groups. Synoptical tables facilitate much the determination of individual specimens. The woodcuts are reproduced from the Proc. Zool. Soc.

FITZINGER, L. J. Revision der Ordnung der Halbaffen oder Äffer (*Hemipithec*). I. Abth. Familie der Makis (*Le-mures*). SB. Ak. Wien, 1870, lxii. pp. 589-666. II. Abth. *Stenopes*, *Otolici*, and *Galeopithec*. Ibid. pp. 685-783.

This announcement will suffice.

BISCHOFF, TH. L. W. Beiträge zur Anatomie des *Hylobates leuciscus*, und zu einer vergleichenden Anatomie der Muskeln der Affen und des Menschen. Abh. Bayr. Ak. Wiss. x. 1870, pp. 199-297, 5 plates.

This memoir contains (1) an account of the general anatomy of *Hylobates leuciscus*, and (2) a detailed description of its myology, which is compared with that of Man and several Monkeys. In a synoptical table all the characteristics of the several muscles in the Gorilla, Orang, Chimpanzee, *Hylobates*, Mandrill, *Cercopithecus*, *Macacus*, *Pithecia*, and *Hapale* are placed side by side, and their relations to those of the corresponding muscles in Man shown. The views regarding the differences between hand and foot are critically examined. The author comes to the conclusion that the statement that the anthropoid Apes are more nearly allied to Man with regard to their muscles than to Monkeys of lower degree, is not correct. He confirms the correctness of the view expressed by Lucä that the posterior hand of Apes osteologically resembles the human hand much

more than the foot of Man or of any other mammal, and he therefore regards the order *Quadrunana* as a perfectly natural division.

Troglodytes. A skin brought from Chartoum does not appear to indicate a specific difference from the West-Coast Chimpanzee. Peters, SB. nat. Fr. Berl. (1869) 1870, p. 25.—Issel describes an example from Central Africa in the Museum at Genoa which appears to the author to be specifically distinct from the known species. Ann. Mus. Civ. Stor. Nat. Genova, 1870, pp. 55–81, pl. 8.

Walker records the easy capture of an adult male Gorilla at Camma, near to the coast. Proc. Lit. & Phil. Soc. Liverp. xxii. p. 5.

Simia satyrus. A foetus described by Salvatore Trinchese, Ann. Mus. Civ. Stor. Nat. Genova, 1870, pp. 1–46, pls. 1–3.

Hylobates leuciscus. On its anatomy, see above (p. 6) under BISCHOFF. Views of its head are given on pl. 1.

Hylobates lar and *H. hoolock* are figured. P. Z. S. 1870, pl. 5.

Hylobates pileatus probably occurs in Hainan, Swinhoe, P. Z. S. 1870, p. 224; and perhaps in Southern China, *ibid.* p. 615.

Semnopithecus rozellana, sp. n., A. Milne-Edwards, Compt. Rend. 1870, lxx. p. 341, Thibet.

Cercopithecus griseoviridis. Notes by Blanford, Observ. Abyss. p. 224.

Macacus andamanensis (see Zool. Rec. vi. p. 13) has been imported into the Andaman Islands from Burmah: F. Hamilton, P. Z. S. 1870, p. 220.—It has been recognized by Mr. Blyth as *M. leoninus* (Blyth), and is figured. Slater, P. Z. S. 1870, p. 663, pl. 35.

Macacus erythræus. Notes on Hainan examples. Swinhoe, P. Z. S. 1870, p. 226.

Macacus cristatus, sp. n., Gray, Cat. Monkeys, p. 30; hab. —?—*M. problematicus*, sp. n., Gray, *l. c.* p. 128, Assam.

Macacus thibetanus, sp. n., A. Milne-Edwards, Compt. Rend. 1870, lxx. p. 341.

Cynocephalus hamadryas. Notes by Blanford, Observ. Abyss. p. 222.

Ateles bartlettii. On a supposed female specimen of this Monkey, Gray, Ann. & Mag. N. H. 1870, vi. p. 428.—Mr. Slater states that this specimen is not the female of this species, which is identical with *Ateles variegatus* of Wagner. *Ibid.* p. 472; and P. Z. S. 1870, p. 668.

Ateles ornatus and *Ateles albifrons*, spp. nn., Gray, Cat. Monkeys, p. 44, South America.

Chiropotes ater, sp. n., Gray, Cat. Monkeys, p. 61, Brazil?

Brachyurus ouacari (Spix) most probably = *Simia melanocephala* (Humboldt). Slater, P. Z. S. 1870, p. 1.

Midas lagonotus and *M. graellsii*, spp. nn., Jimenez de la Espada, Jorn. Lisb. 1870, p. 57, from Ecuador; more fully described in "Algunos datos nuevos &c." (see above p. 3), pp. 16 & 19.

Hapalemur (Prolemur) sinus, sp. n. (= *H. griseus*, Pollen & Van Dam), Gray, P. Z. S. 1870, pp. 828–831, pl. 52 and woodcuts of skull; from Madagascar.

Chirogalus crossleyi, sp. n., Grandidier, Rev. et Mag. Zool. 1870, p. 49, Madagascar.

Propithecus deckeni, sp. n. (= *diadema*, Peters, Mivart, nec Benn.), Peters, Berl. Monatsb. 1870, p. 421, Madagascar.

Chiromys. Hoffmann and Weyenbergh have compared the osteology and myology of the Aye-Aye (from researches made by Owen and others) with that of the Lemurs and Squirrel, and found it to agree with the former in all essential points. See the memoir mentioned above, p. 5.

CHIROPTERA.

We refer again to Dr. GRAY's 'Catalogue of Monkeys &c.' (see above p. 6), which contains references to all the species of *Pteropodidae* and descriptions of those in the British Museum.

FITZINGER, L. J. Kritische Durchsicht der Flatterthiere oder Handflügler (*Chiroptera*). SB. Ak. Wien, 1870, lx. pp. 385-474, 595-652, 823-889; lxi. pp. 123-198, 447-530, 715-828; lxii. pp. 13-144, 211-317, 353-438, 527-582.

An uncritical and incomplete compilation, of the same kind as those of Carnivores by the same author in preceding years.

Pteropus. Dr. Gray (Cat. Monkeys &c.) describes the following new species:—*Spectrum aneitatum*, Aneiteum, p. 101; *Pteropus kelaarti*, Ceylon, p. 104; *P. mysolensis*, East-Indian Archipelago, p. 105; *P. ornatus*, New Caledonia, p. 105; *P. floresi*, Flores, p. 106; *P. loochooensis*, Loochoo, p. 106; *P. caniceps*, Batjan, p. 107; *P. nawaiensis* and *P. flavicollis*, Feejees, p. 107; *P. affinis*, Gilolo, p. 108; *P. tricolor*, Ternate, p. 108; *P. rayneri*, Salomon Isl., p. 108; *P. vitiensis*, Feejees, p. 109; *P. chinensis*, p. 111.—*Eleutherura unicolor*, Gaboon, p. 117; *E. fuliginosa*, Laos Mountains, p. 118; *E. infumata*, Flores, p. 118; *E. fusca*, hab. —?, p. 119; *E. philippinensis*, p. 119.

Cynonycteris collaris. A young one born in the Zoological Gardens, figured with the mother. Sclater, P.Z. S. 1870, p. 127.

Nycteris. A monograph of the species of this genus by Peters, Berl. Monatsb. 1870, pp. 900-907, plate. Nine species; new: *N. angolensis* and *N. damarensis*.

Phyllorhina swinhoii, sp. n., Peters, P.Z. S. 1870, p. 616, Amoy.

Nyctinomus unicolor, sp. n., Grandidier, Rev. et Mag. Zool. 1870, p. 49, Madagascar.—*Nyctinomus angolensis*, sp. n., Peters, Journ. Lib. 1870, p. 124.

Atalapha. A monograph of the species of this genus by Peters, Berl. Monatsb. 1870, pp. 907-914. Eleven species; new: *A. frantzii*, Costa Rica; *A. pallescens*, Venezuela; *A. egregia*, Brazil.

Thyroptera. Jimenez de la Espada (see above, p. 3) relates his observations of these Bats in detail. The sucking-cups consist of a coriaceous disk; they are little hemispheres, hollow, flexible, and extremely movable, on the first phalanges of the thumbs of the wings and near the heels on the soles of the feet. They were used by the animal to fasten itself to the fingers, as it tried to bite, producing the same feeling as a key or thimble when applied to the tongue after sucking out the air. These cups are deep, membranaceous on the edge, fleshy in the centre, those on the wings larger than those on the feet. The muscular arrangement is such as to allow the animal to vary the diameter of the organ; and by their means the animals attached themselves to the sides of the box in which they were kept, although when sleeping they suspended themselves by the claws like other Bats.

Vespertilio mystacinus. A blind albino described, C. Koch, Zool. Gart. 1870, pp. 368-373.

Vespertilio fimbriatus and *V. laniger*, spp. nn., Peters, P. Z. S. 1870, p. 617, Amoy.—*V. bocagii*, sp. n., Peters, Journ. Lisb. 1870, p. 125, Duque de Bragança.—*V. sylvicola*, sp. n., Grandidier, Rev. et Mag. Zool. 1870, p. 49, Madagascar.

Vesperugo pusillulus, sp. n., Peters, Journ. Lisb. 1870, p. 124, Angola.

Vesperugo pulveratus, sp. n., Peters, P. Z. S. 1870, p. 618, Amoy.

INSECTIVORA.

Erinaceus dealbatus, sp. n., Swinhoe, P. Z. S. 1870, p. 450, Peking.

Oryzorictes, gen. nov., Grandidier, Rev. et Mag. Zool. 1870, p. 50. Incisors 3/3; canines 1/1; molars 6/6. Snout terminating in a proboscis, the small nostrils at its extremity. Eyes very small; ears rounded, moderate. Plantigrade; four toes in front, three with very strong curved claws; five toes behind. Upperside of the snout naked, and separated from the hairy lips by a longitudinal furrow. Tail rather short, with longish hairs at the root, nearly naked in the last two thirds, with imbricate rings.—*Oryzorictes hova*, sp. n., Grandidier, *ibid.* Greyish brown. Madagascar.

Nectogale, gen. nov., A. M.-Edwards, Compt. Rend. 1870, lxx. p. 341. A transition form between the Desmans and Shrews: like the former it has the hind feet dilated into natatory pallets; tail long, laterally compressed; snout short; resembling *Sorex* in dentition; sixteen teeth in the upper and twelve in the lower jaw.—*Nectogale elegans*, sp. n., from Thibet.

Anaurosorex, gen. nov., A. M.-Edwards, *l. c.* p. 341. Closely allied to the Shrews, but distinguished by having scaly feet and an extremely short tail; twelve teeth above and below. Sp. —?, from Thibet.

Crocidura. Peters (Berl. Monatsb. 1870) describes the following new species:—*C. retusa*, Ceylon, p. 585; *C. fetida*, Borneo, p. 586; *C. doriae*, Sarawak, p. 587; *C. monticola*, Surakarta, p. 588; *C. microtis*, Hong Kong, p. 589; *C. gracilipes*, East Africa, p. 590; *C. waldemari*, Bengal, p. 590; *C. ceylanica*, p. 591; *C. media*, Ceylon, p. 592; *C. sumatrana*, Palembang, p. 593; *C. fuscipes*, Singapore, p. 594; *C. luzoniensis*, Luzon and Manilla, p. 595.

Talpa europæa. "On the Organs of Vision in the common Mole," R. J. Lee, Proc. Roy. Soc. 1870, pp. 322-327.

Talpa longirostris, sp. n., A. M.-Edwards, *l. c.* p. 341, Thibet.

CARNIVORA.

Dr. E. von MARTENS has published an article on the names of various Carnivores in different languages. Zool. Gart. 1870, pp. 250-256, 275-283.

Felis tigris. The race from Northern Asia described. Swinhoe, P. Z. S. 1870, p. 3.—Notes on Chinese examples. *Id. ibid.* p. 626.

Leopardus japonensis (Gray) inhabits Northern China, Swinhoe, P. Z. S. 1870, p. 4; and is identical with *L. chinensis* (Gray), *Id. ibid.* pp. 430, 628.

Felis macrolepis=*Leopardus brachyurus* (Swinhoe). Swinhoe, *ibid.* p. 628.

Felis chinensis (Gray)=*F. reevesi* (Gray)=*F. javensis* (Sclater, 1866) described. Swinhoe, *ibid.* p. 629.

Pardalina warwicki (Gray) = *Felis geoffroyi* (D'Orb.) is from South America, Sclater, P. Z. S. 1870, p. 796.

Felis colocolo (Molina) described and figured by Philippi, Arch. für Naturgesch. 1870, pp. 41-45, tab. 1. fig. 7.

Felis maniculata and *F. caligata*. Notes by Blanford, Observ. Abyss. pp. 226, 228.

Viverra zibetha = *V. ashtoni* (Swinhoe), Swinhoe, P. Z. S. 1870, p. 630.

Helictis moschata. Notes on Hainan examples, *Id. ibid.* p. 228.

Urva cancrivora described from Chinese examples, *Id. ibid.* p. 630.

Eupleres goudotii. The adult animal and its skull are described and figured, Gray, P. Z. S. 1870, pp. 824-828, pl. 51.

Lycan pictus. Description of its anatomy, Pagenstecher, Zool. Gart. 1870, pp. 197-213, 238-250.

Canis variegatus. Notes. Blanford, Geol. & Zool. Abyss. p. 238.

Canis mesomelas. Notice of an example with a supernumerary premolar by Dönitz, SB. nat. Fr. Berl. 1869 (1870), p. 41.

Vulpes hoole and *V. lineiventer*, spp. nn., Swinhoe, P. Z. S. 1870, pp. 631, 632, from Amoy.

Canis lateralis, sp. n., Sclater, P. Z. S. 1870, p. 279, pl. 23, from the river Fernand Vas, south of the Gaboon.

Martes flavigula. Notes on Formosan specimens, Swinhoe, P. Z. S. 1870, p. 623.

Mustela sibirica. Notes on Chinese examples, *Id. ibid.* p. 624.

Mustela vulgaris var. *meridionalis* compared with *M. boccamela*, Costa, Annuar. Mus. Nap. v. 1869, p. 39.

Lutra marina. "Sea-Otters" by Capt. C. M. Scammon, Amer. Natur. iv. 1870, pp. 65-74. Contains chiefly notes on the modes of capture.

Lutra chinensis and *L. swinhoei*. Notes on these two species. Swinhoe, P. Z. S. 1870, pp. 624, 625.

Aonyx leptonyx. Notes on Hainan examples. *Id. ibid.* p. 229.

Mephitis chilensis, sp. n. (?), Sclater, *ibid.* p. 665.

Ursus tibetanus (F. Cuv.) = *U. formosanus* (Swinhoe). Notes on Formosan specimens, Swinhoe, *ibid.* p. 622.

Meles leptorhynchus (M.-E.) = *M. chinensis* (Gray). Notes. Swinhoe, *ibid.* p. 622.

Ailuropoda, gen. nov., A. M.-Edwards, Compt. Rend. 1870, lxx. p. 342; externally like a Bear, but approaching the *Procyonidae* and *Ailurus* in its osteology and dentition. *Ailuropoda melanoleucus*, sp. n. (David), from Eastern Thibet.

Aelurus fulgens. Prof. Flower has examined the anatomy of the Panda, and confirms the view previously held by him, that it is most nearly allied to the *Procyonidae*. P. Z. S. 1870, pp. 752-769 (woodcuts). Mr. Bartlett's remarks on its habits, *ibid.* pp. 769-772.

PINNIPEDIA.

Otariidae. "On the eared Seals (*Otariidae*), with detailed descriptions of the North Pacific species by J. A. ALLEN. Together with an account of the habits of the Northern Fur-seal (*Callorhinus ursinus*) by CH. BRYANT." Bull. Mus. Comp. Zool. Cambr. ii. no. 1, 1870, 8vo, pp. 108, three plates. Mr. Allen gives

a *résumé* of the recent literature of the subject*, and treats of the affinities and characters of this group. In a conspectus he admits *six* out of the fifteen species proposed; and these are referred to *five* genera. He describes in detail *Otaria stelleri* from two skins and two skeletons, *Otaria gillespii* from two skulls, *Otaria ursina* from several examples. Capt. Bryant's account of the habits and modes of capture of the last species is most interesting, and contains some startling observations. The plates represent skulls and the dentition of *O. stelleri* and *O. ursina*.

Otaria. Dr. G. A. Maack gives an account of his expedition to the eastern coast of South America, to obtain examples of *O. leonina* and *O. falklandica*. Zool. Gart. 1870, pp. 1-8. A male of the former is figured.

Otaria jubata occurs as far north as Zorritos in Peru. A. E. V[errill]. Sillim. Journ. 1870, l. p. 431.

Trichechus rosmarus. On the want of direct connexion between the diaphragm and pericardium, Turner, Journ. Anat. & Physiol. v. 1870, p. 115.—A Labrador specimen described and figured by Gilpin, Proc. & Trans. N. Scot. Inst. Nat. Sc. ii. 3, 1870, pp. 123-127.

Phocidæ. A. Quennerstedt has published notes on *Phoca barbata*, *P. grænlantica* and *Cystophora*, especially with regard to their distribution, occurrence, habits, and mode of capture, Svensk. Vet. Ak. Handl. vii. 1868. He figures the young of *P. grænlantica*, Taf. 1. fig. 1, *P. barbata*, fig. 2, and the young and male of *Cystophora* on Taf. 2.

Phoca grænlantica. Notes on its modes of progression and its anatomy, Murie, P. Z. S. 1870, pp. 604-608, pl. 32.

Phoca hispida. Remains of a Seal found in the brick-clays of various parts of Scotland are referred by Prof Turner to this species, which does not visit the British Islands at the present period†. Journ. Anat. & Physiol. iv. 1870, pp. 260-270, with woodcuts.

Phoca. On the Seal of the islands off the north-western coast of the Cape Colony as an article of trade, and on the preparation of the furs, E. Hérítte, Bull. Acclim. 1870, pp. 560-565.

Halichærus grypus captured on the Scotch coast. Turner, Journ. Anat. & Physiol. 1870, p. 270.

Stenorhynchus leptonyx common on the coasts of New Zealand, Hector, Ann. & Mag. N. H. 1870, v. p. 220.—Described from New-Zealand specimens. J. S. Webb, Tr. N. Z. Inst. ii. 1870, pp. 28-32.—On a (probably new) variety of the Small-nailed Seal, allied to the *Phoca leopardina* of Jameson. Ch. Fraser, Tr. N. Z. Inst. ii. 1870, p. 33.

RODENTIA.

Prof. HYRTL has found a spiral valve in the *vena porta* of all families of Rodents. SB. Ak. Wien, lxi. pp. 27-32, plate.

* Mr. Allen (p. 12) states that in the Zool. Record for 1868 Dr. Günther had regarded M'Bain's *O. ulloæ*? as a new species, and proposed for it the name of *Arctocephalus grayi*. This is a mistake, which would have been avoided by reading M'Bain's paper; M'Bain himself proposed this name.

† [Its occurrence on the English coast, in 1846, has since been announced by Prof. Flower to the Zoological Society, June 1871 (cf. Tr. Norw. Soc. 1871, p. 77).—Ed.]

Sciurus. Mr. Swinhoe includes in his list of South Chinese Mammals four Squirrels, one of which is *Sciurus castaneiventris* (Gray) = *S. erythræus* (Swinhoe, 1862), and probably = *S. lokriah* (Hodgs.) = *S. lokrioides* (Hodgs.) = *S. erythrogaster* (Blyth). P. Z. S. 1870, pp. 633, 634.

Sciurus leuco-umbrinus (Rüpp.) = *S. setosus* (Gray), Blanford, Observ. Abyss. p. 279.

Sciurus castaneiventris and *S. m'clellandi*. Notes on Hainan examples. Swinhoe, P. Z. S. 1870, pp. 231, 232.

Sciurus vulgaris. Hoffmann and Weyenbergh's memoir on its osteology and myology has been noticed above, p. 5.

Sciurus dorsalis (Gray) varies in coloration, and is from Nicaragua, not from Caraccas. Selater, P. Z. S. 1870, p. 670.

Pteromys pectoralis, sp. n., Swinhoe, *ibid.* p. 634, Formosa.—*Pteromys alborufus*, sp. n., A. Milne-Edwards, Compt. Rend. 1870, lxx. p. 342, Thibet.

Castor fiber. "Notes on Beaver Dams," by A. Agassiz, Proc. Bost. Soc. Nat. Hist. xiii. 1869, pp. 101-104. In Newfoundland. H. Reeks, Zool. s. s. pp. 1953-1961.

Mus. Mr. Swinhoe enumerates 12 species from Southern China, P. Z. S. 1870, p. 635; one of them is *Mus alexandrinus*.

Mus cana and *M. losea*, spp. nn., Swinhoe, *ibid.* pp. 636, 637, Formosa.—*Mus ningpoensis*, sp. n., *Id. ibid.* p. 637, Ningpo.

Cricetus nigricans occurs in Bulgaria. Alfred Newton, P. Z. S. 1870, p. 331, pl. 26.

Nesomys, gen. nov., Peters, Sitzgsb. Ges. nat. Fr. Berl. 1870, p. 54. Allied to *Hesperomys*. Upper lip with a naked longitudinal groove, but not cleft. Otherwise very like *Mus* externally. Toes 4-5; tail long, annulated and scantily hairy. Incisors smooth; molars 3/3, as in *Hesperomys*. *Nesomys rufus*, sp. n., Madagascar.

Arvicola subterranea found in Austria. Jeitteles, Verh. Z.-B. Ges. Wien, 1870, Sitzgsber. p. 45.

Bathyergus splendens. Notes. Blanford, Observ. Abyss. p. 279.

Pectinator speki. Notes. Blanford, *ibid.* p. 281.

Hystrix hodgsoni appears to occur in Hainan, Swinhoe, P. Z. S. 1870, p. 233. [Is this the same as that afterwards described as *H. subcristatus*?]

Hystrix subcristata, sp. n., Swinhoe, *ibid.* l. c. p. 638, Southern China.

Lepus. On some peculiarities of the bones of the skull and the osseous parts of the organ of hearing, R. Himstedt, Arch. Anat. Phys. 1870, pp. 437-453, pl. 11.

Lepus hainanus, sp. n., Swinhoe, P. Z. S. 1870, p. 233, pl. 18, from Hainan.

Lepus sinensis, described. Swinhoe, *ibid.* p. 639.

Lepus ægyptius, Geoffr. = *L. abyssinicus*, Gray: Blanford, Observ. Abyss. p. 273.—*L. tigrensis* (Blanford) redescribed, *ibid.* p. 275.

Lepus palustris. "Observations on the Marsh-Hare," E. Coues, Proc. Bost. Soc. Nat. Hist. xiii. 1869, pp. 86-93. The skull is also described.

EDENTATA.

Manis dalmanni. Notes on Hainan examples, Swinhoe, P. Z. S. 1870, p. 236.—Described in detail, *Id. ibid.* p. 650.

Chlamydophorus truncatus. "On some points of osteology of the Pichi-ciégo," E. Atkinson, Journ. Anat. & Physiol. v. 1870, pp. 1-16, pl. 1.

Orycteropus aethiopicus is figured from a living example. Sclater, P. Z. S. 1870, p. 669.

Myrmecophaga tamandua. On the salivary glands, J. Chatin, Ann. Sc. Nat. xiii. 1870, art. 8, pp. 17, plate.

Bradypus ephippiger is described as a supposed new species. Philippi, Arch. Naturgesch. 1870, pp. 263-267, tab. 3, from Ecuador?

PACHYDERMATA.

Sus scrofa. A cyclopean monstrosity is described in detail. Elliott Coues, Proc. Bost. Soc. Nat. Hist. 1869, xiii. pp. 93-101, with woodcut of skull.

Sus pliociceps. "Der Schädel des japanischen Maskenschweins und der Einfluss der Muskeln auf dessen Form," C. G. Lucä, Abhandl. Senckenb. Ges. vii. 1870, pp. 457-486, 3 plates. [The skull of *Sus pliociceps* from Japan, and the influence exercised by the muscles on its shape.]

Sus leucomystax (T. & Schl.) and *S. taiwanus* (Swinh.). Observations on these two species, Swinhoe, P. Z. S. 1870, pp. 639 & 641; the heads and molar dentition are figured.

Phacochoerus. Dr. Gray states that the animal figured by Mr. Sclater in P. Z. S. 1869, pl. 20, and p. 277, fig. 2, is only the usual form of the female of the African Wart-hog, that it is certainly not *P. aeliani* (Rüppell), and that, if it be a distinct species, it may be named *P. sclateri*. Ann. & Mag. 1870, vi. p. 190.—In a subsequent note he expresses his doubts whether the animal is a species of *Phacochoerus*, and not rather of *Sus*, *ibid.* p. 263.—Mr. Sclater, in reply, states that Dr. Gray's remarks have not induced him to change his opinion regarding the distinctness of the two species, and the correct determination of the specimen figured, *ibid.* p. 404.—Reply by Dr. Gray, *ibid.* p. 455.—Notes by Blanford, Observ. Abyss. p. 241.

Elasmognathus dowi, sp. n., Gill, Sillim. Journ. 1870, l. p. 141, Guatemala.

Rhinoceros keilloa. Notes. Blanford, Observ. Abyss. p. 243, with woodcuts of head and horns.

Hyrax. The results of Mr. Blanford's examination of the species of this genus (see Zool. Record, vi. p. 21) are reproduced in his Observ. Abyss. pp. 249-257.

Hyrax mossambicus, sp. n., Peters, SB. nat. Fr. Berl. (1869) 1870, p. 26.

Equus. Prof. Owen, in his "Description of the cavern of Bruniquel, and its organic contents. Part II. Equine Remains" (Phil. Trans. vol. clxx. 1870, pp. 535-557), compares the dentition of *Equus spelæus* with those of *E. caballus*, *E. asinus*, *E. hemionus*, *E. quagga*, *E. zebra*, and *E. burchelli*; detailed descriptions and figures are given, pls. 57-60.

M. A. Milne-Edwards redescibes a cross between *E. hemionus* and a Mare, and figures it in Nouv. Arch. Mus. v. Bull. p. 37, pl. 2; also a cross between *E. hemionus* and a Donkey, pl. 3; *E. hemionus* var. *syriacus*, pl. 4; and the Wild Ass of Abyssinia, pl. 5.

Equus caballus. "Note sur le cheval aux temps du nouvel empire égyptien," F. Lenormant, Compt. Rend. 1870, lxx. pp. 163-167.

RUMINANTIA.

Bos. "Note sur quelques espèces de Bœuf de l'Inde," T. C. Viennot, Bull. Acclim. 1870, pp. 401-408.—"Notice sur la race bovine sauvage des Maures," T. Turrell, Bull. Acclim. 1870, pp. 409-416.

Bos chinensis. Observations on the South China Cattle. Swinhoe, P. Z. S. 1870, pp. 648-650. A bull and the skull are figured.

Antilope. "Sur la domestication de quelques espèces d'antilopes au temps de l'ancien empire égyptien," F. Lenormant, *Compt. Rend.* 1870, lxx. pp. 413-416.

Antilope. The species observed by Mr. Blanford (*Geol. & Zool. Abyss.*) were:—*Antilope sømmeringii* (p. 260), *A. dorcas* (p. 261), *A. beisa* (p. 262), *A. oreotragus* (p. 265), *A. montana* (p. 266), *A. madoqua* (p. 267), *A. saltiana* (p. 268), *A. strepsiceros* (p. 270). The horns of *A. dorcas*, and for comparison those of *A. bennetti*, *A. arabica*, *A. subgutturosa*, and *A. spekei*, are figured, pl. 1.

Antilope maxwelli and *A. pygmaea*. Notes on the skulls. Giebel, *Zeitschr. ges. Ntrw.* 1870, xxxv. pp. 43-47.

Capricornis swinhoei. Notes. Swinhoe, P. Z. S. 1870, p. 647.

Saiga tartarica. Dr. Murie has given a most complete account of the organization of this animal, which he regards as an "Antilopine Sheep." P. Z. S. 1870, pp. 451-503. This excellent memoir is illustrated by many woodcuts.

Antilocapra americana. Dr. Murie has worked out the anatomy, and given a detailed description of its external and internal organization. *Ibid.* pp. 334-368, with woodcuts.

Mr. Sclater divides the "*Cervidae*" into 8 genera, and enumerates 23 Old-World, and 17 New-World species of the genus *Cervus*. P. Z. S. 1870, pp. 114-116.

Cervus alces. Prof. Brandt has come to the conclusion that the Elks of both hemispheres, as well as the fossil remains, form only one species. *Bull. Ac. Sc. St. Pétersb.* 1870, p. 254.

Cervus alces. A pair of "Spike-horns" figured. J. A. Allen, *Amer. Nat.* 1870, iv. p. 443. On its distribution in New England, *ibid.* pp. 535-536.

Cervus eldi. Dr. Murie describes and figures a case of malformation of one horn, the frontal base of which had been injured. P. Z. S. 1870, pp. 611-614.

Cervus alfredi, sp. n., Sclater, *ibid.* p. 381, pl. 28, Malayan peninsula?

Cervus pseudaxis (= *C. taiwanus*, Blyth) and *Cervus swinhoei*. Notes on these two species, Swinhoe, *ibid.* pp. 644 & 646.

Xenelaphus leucotis [*Zool. Rec.* vi. p. 22]. Dr. Philippi states that this deer is not the Huemul of Chili (*Cervus chilensis*), nor likely to occur in Chili. *Arch. für Naturgesch.* 1870, pp. 46-49. The author directs his critical remarks against a paper by Dr. Gray published in a popular periodical, and appears to be unacquainted with that published in P. Z. S. 1869, p. 496.

Hydropotes inermis, gen. et sp. n., Swinhoe, P. Z. S. 1870, pp. 89-92, pls. 6 & 7 (animal and skull), from the Yangtze-river districts in China. This Deer approaches *Moschus* in the small size of the lachrymal fossa, long canines in the male; no horns or frontal protuberances.

Tragulus meminna. Its placenta shows the same characters as that of *T. stanleyanus*. A. Milne-Edwards, *Ann. Sc. Nat.* xiii. 1870, art. 6.

SIRENIA.

Halicore. Contributions to its osteology. F. Krauss, *Arch. Anat. Phys.* 1870, pp. 525-614.

CETACEA.

GRAY, J. E. Synopsis of the species of Whales and Dolphins in the Collection of the British Museum. London: 1868, 4to, pp. 10, with 38 plates.

This consists chiefly of a reproduction of the plates of Cetaceans figured in the zoological part of the 'Voyage of the Erebus and Terror,' to which are added plates 31 to 37 of that work, hitherto unpublished. The text contains a systematic list of the species known; those figured on pls. 31-37 will be mentioned separately.

Dr. J. E. GRAY has published a review of the "Ostéographie des Cétacés," by Van Beneden and Gervais [Zool. Rec. v. p. 5, and vi. p. 3], under the title "Observations on the Whales described in the 'Ostéographie' &c.," in Ann. & Mag. N. H. 1870, vi. pp. 193-204. These remarks refer chiefly to the difference of views with regard to the distinction of the species and genera of Right Whales.—Prof. van Beneden, in a reply in Bull. Ac. R. Belg. xxx. 1870, pp. 380-388, adheres to the views expressed by him in the 'Ostéographie.'

Dr. J. E. GRAY has compiled a list of all the species of Cetaceans, and arranged them geographically. Ann. & Mag. N. H. 1870, vi. pp. 387-394.

[ESCHRICHT, D. F.] Ni Tavler til oplysning af Hvaldyrenes Bygning, udførte til utrykte foredrag af afdøde Etatsraad Dr. D. F. Eschricht. Med tilhørende Forklaring. Vidensk. Selsk. Skr. 5, ser. vol ix. Kjöbenh. 1869, pp. 14.

Nine plates illustrating the structure of various parts of Cetaceans were found among the literary matter left by Prof. Eschricht at his death. Professors STEENSTRUP and REINHARDT proposed to the Copenhagen Academy of Sciences to publish them, with explanations prepared by the latter. This has been done in the Transactions of that Academy. The subjects figured will be mentioned under the species to which they refer.

VAN BENEDEN, P. J. Les Cétacés, leurs Commensaux et leurs Parasites. Bull. Ac. R. Belg. xxix. 1870, pp. 347-368, with woodcuts.

We refer to Zool. Rec. vi. p. 126, for Prof. van Beneden's memoir on this subject generally.

OWEN, R. Monograph of the British fossil *Cetacea* from the Red Crag. I. Genus *Ziphius*. Printed for the Palæontographical Society. London: 1870, 4to, pp. 40, plates 1-5.

Although the object of this memoir is the determination and description of extinct species, it is of no less importance to the zoologist than to the palæontologist. In fact, the author bases his researches entirely on a previous comparative account of the

recent forms of Ziphioid Whales. He reviews critically the various contributions to this part of Cetological literature, protesting against the tendency of establishing genera where scarcely specific distinctness is indicated. Of living species, skulls of *Ziphius indicus*, *Z. layardi*, *Z. arnouzii*, *Z. micropterus*, *Z. sowerbii*, and *Z. densirostris* are figured.

Balæna mysticetus. Heart figured by Eschricht, *l. c.* tab. 5, with explanation by Reinhardt.

Balæna japonica. Skull of a female fœtus figured by Eschricht, *l. c.* pls. 1 & 2, with explanation by Reinhardt.

Balæna marginata. Notes on New-Zealand examples by Hector and Gray, *Ann. & Mag. N. H.* 1870, v. p. 221; *Trans. N. Z. Inst.* 1870, ii. p. 26, pl. 2 b, with figures of skull. It is the type of a new genus, *Neobalæna*, Gray, *Ann. & Mag. N. H.* 1870, vi. pp. 154-157, with figure of skull, copied from Hector.

Megaptera boops. Brain figured by Eschricht, *l. c.* pls. 3 & 4, with explanation by Reinhardt.—Cervical vertebræ figured by Gray, *Synopsis*, pl. 32 a, figs. 1, 2, 6.

Megaptera longimana. Cervical vertebræ figured by Gray, *Synopsis*, tab. 33, figs. 1, 2.

Physalus antarcticus (?). Notes on New-Zealand examples by Hector, *Ann. & Mag. N. H.* 1870, p. 224.

Balænoptera sibbaldi. "Preliminary notice of the Great Fin-Whale recently stranded at Longniddry," by W. Turner, *Proc. R. Soc. Edinb. Sess.* 1869-70, pp. 34-38.—"On the sternum and ossa innominata of the Longniddry Whale" (female and fœtus), *Id. Journ. Anat. and Physiol.* 1870, pp. 271-281.—"An Account of the Great Finner Whale stranded at Longniddry. Part 1. The Soft Parts," *Id. Trans. R. Soc. Edin.* xxvi. 1870, pp. 197-251, pls. 5-8. This memoir contains also a description of the external appearance of this specimen, which proved to be a pregnant female; it is figured on pl. 5.—Cervical vertebræ figured by Gray, *Synopsis*, tab. 33, figs. 5, 6.

Balænoptera musculus. An additional note to the description of an example stranded in 1869 [see *Zool. Rec.* vi. p. 23], by Prof. Flower, *P. Z. S.* 1870, p. 330.—Cervical vertebræ figured by Gray, *Synopsis*, pl. 32 a, figs. 5, 6.

Balænoptera rostrata. Notes on the anatomy of a young female captured at Weymouth in 1870 by J. P. Perrin, *P. Z. S.* 1870, pp. 805-817.—Cervical vertebræ figured by Gray, *Synopsis*, pl. 32 a, figs. 3 & 4.

Delphinidæ. In "Notes on the arrangement of the genera of Delphinoid Whales," Dr. Gray proposes the following scheme (*P. Z. S.* 1870, pp. 772-773):—

I. Pectoral fin elongate, falcate, &c.

A. Pectoral fins from the sides of the body; the second and third fingers of 6 or 8 phalanges; the head beaked: *Iniidæ* and *Delphinidæ*.

B. Pectoral fins low down on the sides of the body, narrow and elongate; second and third fingers of 9 or 10 phalanges; head swollen: *Globicephalidæ*.

II. Pectoral fin short, broad, &c.: *Orcidæ*, *Belugidæ*, and *Pontoporidæ*.

Orca. Dr. Gray has reexamined the skulls of this genus, Proc. Zool. Soc. 1870, pp. 70–77. He divides the species thus:—

- a. *Gladiator*: 1. *Orca stenorhyncha*, sp. n., from the North Sea, p. 71, with fig. of skull.
- b. *Orca*: 2. *O. capensis*, with fig. of skull; 3. *O. latirostris*, sp. n., North Sea; 4. *O. magellanica*.
- c. *Ophysia*: 5. *O. pacifica*, sp. n.
- d. *Feresa*: 6. *O. intermedia*.
- e. *Orcaella*: 7. *O. brevirostris*.

The two British species are also noticed in Ann. & Mag. 1870, v. p. 148.

Orca magellanica described by Burmeister, An. Mus. Buen. Aires, 1869, pp. 373–380, pl. 22.

Grampus rissoanus. A detailed description of this Dolphin, and of the anatomy of its soft parts. Murie, Journ. Anat. & Physiol. v. 1870, pp. 118–138, pl. 5.

Phocæna communis. Brain figured by Eschricht, l. c. pl. 9, with explanation by Reinhardt.

Phocæna spinipinnis described by Burmeister, An. Mus. Buen. Aires, 1869, pp. 380–388, pls. 23 & 24.

Globicephalus macrorhynchus. Notes by Hector, Ann. & Mag. N. H. 1870, v. p. 222, and Tr. N. Z. Inst. 1870, ii. p. 28.

Globicephalus grayi described by Burmeister, l. c. pp. 367–373, pl. 21.

Delphinus sinensis. The skeleton described and figured. W. H. Flower, Trans. Zool. Soc. 1870, pp. 151–160, pls. 10 & 18.—Notes on its occurrence, Swinhoe, P. Z. S. 1870, p. 652.

Delphinus euphrosyne. Skull figured, Gray, Synopsis, tab. 31.—*D. alope*. Skull figured, *Id. ibid.* tab. 32b.—*D. eutropia*. Skull figured, *Id. ibid.* tab. 34.

Delphinapterus leucas has been observed in the Baltic. Hisinger, Cefvers. Finsk. Vet.-Selsk. Förh. xii. 1870, p. 136.—Skull and dentition figured, Eschricht, l. c. pl. 8, with explanation by Reinhardt.

Pontoporia blainvillii. A detailed description of its external and internal organization, Burmeister, An. Mus. Buen. Aires, 1869, pp. 389–442, pl. 23. fig. 1, and pls. 25–28.

Lagenorhynchus clanculus. Notes: Hector, Ann. & Mag. N. H. 1870, v. p. 223, and Tr. N. Z. Inst. 1870, ii. p. 27.—Skull figured, Gray, Synopsis, tab. 35.

Lagenorhynchus thicola. Skull figured, *Id. ibid.* tab. 36.

Hyperoodon latifrons. Skull of a male figured, Eschricht, l. c. pl. 6, with explanation by Reinhardt.

Hyperoodon rostratus. A male fœtus and its skeleton figured, Eschricht, l. c. pl. 7, with explanation by Reinhardt.

Ziphius. See above (p. 15), under OWEN, R.

Ziphius sowerbiensis. An account of its history, with notes on the example referred to in Zool. Record, iv. p. 39, W. Andrews, Trans. R. Ir. Acad. xxiv. pp. 429–438. The snout is figured on pl. 25.—Skull figured, Gray, Synopsis, tab. 37.

Ziphius arnouxii. Notes: Hector and Haast, Tr. N. Z. Inst. 1870, ii. p. 27, and Ann. & Mag. N. H. 1870, v. p. 222.—“Preliminary notice of a Ziphoid Whale, probably *Berardius arnuxii*, stranded on the 16th of December, 1868, on the sea-beach, near Brighton, Canterbury, New Zealand,” Haast in Tr. 1870. [VOL. VII.]

N. Z. Inst. ii. 1870, pp. 190-192; reproduced in Ann. & Mag. N. H. 1870, vi. pp. 348-351.

Dioplodon sechellensis. Notes on the skeleton of a Whale from Lord Howe's Island, believed to be this species, Krefft, P. Z. S. 1870, p. 426.—Note and figure of a skeleton from a photograph communicated by Mr. Krefft, Gray, Ann. & Mag. N. H. 1870, vi. p. 343.

MARSUPIALIA.

Phascalomys wombat. Its myology worked out, A. Macalister, Ann. & Mag. N. H. 1870, v. pp. 153-173.—On the peritoneum and abdominal organs, Cleland, Journ. Anat. & Physiol. iv. p. 197, pl. 8.

Macropus erubescens, sp. n., Sclater, P. Z. S. 1870, p. 126, pl. 10, from Lake Hope, South Australia.

Sarcophilus ursinus. Its myology worked out: A. Macalister, Ann. & Mag. N. H. 1870, v. pp. 153-173.

AVES

BY

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AND

H. E. DRESSER, F.Z.S. &c.

THE authors of the following 'Record' cannot but feel that there are many imperfections in their contribution; but they trust that greater experience will another year result in a more thorough knowledge of their duties, and, consequently, in a more satisfactory discharge of their undertaking.

BIBLIOGRAPHY AND CRITICISM.

BULLER, W. Critical Notes on the ornithological portion of Taylor's 'New Zealand and its Inhabitants.' [See "AUSTRALIAN REGION."]

HARTLAUB, G. Bericht über die Leistungen in der Naturgeschichte der Vögel während des Jahres 1869. Arch. f. Nat. xxxvi. Band ii. pp. 1-44.

This, as usual, gives a concise review of ornithological progress in the year 1869. Dr. Hartlaub here completes his *Twenty-fourth* annual report, and in it particularizes the supposed new species which receive names for the first time in Part I. of Mr. Gray's 'Hand-list.'

HEUGLIN, M. TH. VON. Einige Noten zu L. Taczanowski's Uebersicht der Vögel Algeriens. J. f. O. 1870, pp. 383-385.

Contains a few criticisms on the paper noticed further on. [See "PALÆARCTIC REGION."]

HOMER, ALEX. VON. Dr. Anton Fritsch. Die Naturgeschichte der Vögel Europa's. J. f. O. 1870, pp. 150-152.

A review of the work named, which is well spoken of.

HOMER, ALEX. VON. Zusätze und Berichtigungen zu Dr. Bernhard Borggreve's Werk: "Vogel-Fauna von Norddeutschland." *Tom. cit.* pp. 214-231.

These relate to ninety of the species included in the work criticized, which was noticed last year (*Zool. Rec.* vi. p. 31).

SALVADORI, T. Rivista critica del catalogo descrittivo di una collezione di Uccelli fatta da Orazio Antinori nell' interno dell' Africa centrale nord. [See "ETHIOPIAN REGION."]

SHARPE, R. B. Critical Remarks on Dr. von Heuglin's 'Ornithologie Nordost-Afrika's.' [See "ETHIOPIAN REGION."]

STÖLKER, CARL. Bibliographia Ornithologica helvetica. Bull. Soc. Orn. Suisse, ii. pp. 89-119.

A paper of great utility, which, after a full record of the literature of Swiss ornithology, gives a further list of papers referring to the various species under their respective names.

THE GENERAL SUBJECT.

BRUHIN, TH. A. Die Iris der Vögel, insbesondere der Raub-, Sumpf- und Schwimmvögel der deutschen Fauna, als unterscheidendes Merkmal der Arten, des Alters und Geschlechtes. *Zool. Gart.* 1870, pp. 290-295.

Gives the colour of the iris in most German birds.

DRACHENFELS, CARL, BARON. Briefliches über Zuchtversuche fremdländischer Vögel. *J. f. O.* 1870, pp. 145-150.

FRAUENFELD, G. RITTER VON. Ueber den Wert der Vögel in Bezug auf das Vogelschutzgesetz. *Bl. Ver. Landeskn.* Niederöst. 1870, pp. 1-10.

On the value of legislation for the protection of birds, with particulars of the utility of the various species.

GIGLIOLI, H. H., & SALVADORI, T. On some other new and little-known birds [*Sylviidae*, *Sturnidae*, and *Columbidae*] collected during the Voyage round the World in 1865-68 of H.I.M.'s S. Magenta. *Ibis*, 1870, p. 185. Translated *Atti Acc. Tor.* 1870, pp. 273-276.

GRAY, G. R. Hand-list of Genera and Species of Birds, distinguishing those contained in the British Museum. Part II. *Coniostres*, *Scansores*, *Columbæ*, and *Gallinæ*. London: 1870. 8vo, pp. 278.

The second part of this most important work (*cf.* *Zool. Rec.* vi. p. 27) calls for hearty admiration and praise, though it is not until the appearance of the concluding portion, which we understand will contain an elaborate index, that its full value will be appreciated. It may be mentioned that in Dr. Hartlaub's last 'Bericht' (noticed above) is contained a list of the

supposed new species named by Mr. Gray in the first part of this work.

HOCKER, J. Ueber die Bastardirung der Vögel. J. f. O. 1870, p. 152.

Hybrids between *Pavo cristatus* and *Numida meleagris*.

MAREY, E. J. Sur le mécanisme du vol des oiseaux. C. R. 1870, pp. 1255–1258.

Contains some more interesting observations on the flight of birds. (Cf. Zool. Rec. vi. p. 28.)

MARSH, O. C. Notice of some Fossil Birds from the Cretaceous and Tertiary formations of the United States. Am. J. Sc. 1870, pp. 205–217.

The remains of nine new species of fossil birds, five from the cretaceous and four from the tertiary formations, are described. Those from the former belong to extinct and now unrepresented forms; those from the latter are referred to *Puffinus*, *Catarractes*, *Grus*, and *Graculus*.

MARTIN, P. L. Die Praxis der Naturgeschichte. Weimar: 1870. 8vo, pp. 240, pls. vi.

Contains practical hints on the mounting of birds and other animals, the arrangement of museums, and so forth.

NOLL, F. C. Vögel und Pflanze. Zool. Gart. 1870, pp. 301–311.

On the agency of birds in the distribution of plants.

PARKER, H. W. Carbolizing Birds. Am. J. Sc. 1870, p. 283.
Describes the mode of preserving birds with carbolic acid.

RUSS, K. Jahresbericht aus meiner Vogelstube. J. f. O. 1870, pp. 25–31.

Notes on birds in confinement.

SELENKA, EMIL. Dr. H. G. BRONN's Klassen und Ordnungen des Thier-Reichs, wissenschaftlich dargestellt in Wort und Bild. Sechster Band. IV. Abtheilung. Vögel: *Aves*. Lieferungen 3–6. Leipzig und Heidelberg: 1870. 8vo, pp. 81–144, pls. vii.–xxiv.

This work is continued in the same clear style as that in which it was commenced (cf. Zool. Rec. vi. p. 30). The four parts under consideration refer principally to the muscles, the dissertation on which is introduced by a good account of the literature relating to these structures. The plates are carefully drawn, and those illustrating the muscles, being partially coloured, are especially instructive. [See also "ANATOMY."]

SOUTHWELL, T. On the Flight of Birds. Tr. Norw. Soc. 1870, pp. 41–59.

Contains many original observations, with references to some of the authors who have studied the matter.

STREETS, T. HALE. Remarks on Huxley's Classification of Birds. P. Ac. Philad. 1870, pp. 84-88.

A few criticisms and additional notes on Prof. Huxley's celebrated paper (Zool. Rec. iv. p. 46).

SWINHOE, R. List of Birds collected by Mr. Cuthbert Collingwood during a cruise in the China and Japan seas, with Notes. P. Z. S. 1870, pp. 600-604.

The specimens collected by Mr. Collingwood during his voyage (Zool. Rec. v. p. 33) have been examined and named by the author. They belong to 33 species.

TRISTRAM, H. B. Notes on some Old-World species of Passerine Birds [*Cinclidæ*, *Turdidæ*, *Sylviidæ*]. Ibis, 1870, pp. 493-497.

WOOD, T. W. The Courtship of Birds. Stud. 1870, pp. 113-125, pls.

A popular essay on this subject, illustrated by sketches of some of the extraordinary positions assumed by the male of various species during the season of love.

PALÆARCTIC REGION.

ADAMS, ARTHUR. Travels of a Naturalist in Japan and Manchuria. London: 1870. 8vo, pp. 334.

An interesting volume, but calling for no special remark from an ornithologist.

BALDAMUS, E. Ornithologisches aus meinen Tagebüchern. J. f. O. 1870, pp. 94-118.

Notes of a journey in Southern Germany and Switzerland.

BETTONI, EUGENIO. Storia Naturale degli Uccelli che nidificano in Lombardia ad illustrazione della raccolta ornitologica dei fratelli ERCOLE ed ERNESTO TURATI, con tavole litografate e colorate prese dal vero da O. DRESSLER. Milano: 1870. Folio. Vol. ii. fascicoli xxiv.

A continuation of the work before noticed (Zool. Rec. vi. p. 31). The species of which the young and eggs are figured will be named under "NEOSSOLOGY" and "OOLOGY."

BUCKLEY, T. E. [See ELWES, H. J.]

DE SELYS-LONGCHAMPS, BARON. Notes on various Birds observed in Italian Museums in 1866. Ibis, 1870, pp. 449-455.

Most of the notes relate to European birds; but there are a few on exotic species [*Psittacidæ*, *Ampelidæ*].

ELWES, H. J., & BUCKLEY, T. E. A List of the Birds of Turkey. *Tom. cit.* pp. 59-77, 188-201, 327-343.

A very useful paper, giving, for the first time, a full list of all the species of this part of Europe. The authors also enumerate such contributions to Turkish ornithology as have before appeared, and add to what was already known on the subject some capital field-notes of their own.

FISCHER, JOHANN VON. Die Vögel des St. Petersburger Gouvernement. *Zool. Gart.* 1870, pp. 344-352.

A useful paper, as hitherto no good general account of the birds of this part of Russia existed.

GILLET, GEORGE. On the Birds of Novaya Zemlya. *Ibis*, 1870, pp. 303-310.

Beyond the brief account (*Bull. Pétersb.* iii. p. 343) of Von Baer's visit in 1837, nothing has been known of the zoology of this country. Twenty-eight species are enumerated, of which four were not fully determined. Ten of them are not recorded by Von Baer, who observed in all twenty-four species, six of which were not noticed by Mr. Gillett.

GODMAN, F. DU CANE. Natural History of the Azores or Western Islands. London: 8vo, pp. 358, and 2 maps.

The ornithological part of this model work is an amplification of the author's former paper (*Zool. Rec.* iii. p. 50).

GEBEL, H. Ein Ausflug an die Djepermündung vom 28. bis 31. Mai, 1869. *J. f. O.* 1870, pp. 141-144.

——. Die in den Jahren 1867, 1868 u. 1869 im Umanschen Kreise (Gouvernement Kiew) beobachteten Vögel. *Tom. cit.* pp. 177-203, 440-456.

Notes on the birds of Southern Russia, chiefly in regard to their nidification.

GOULD, J. The Birds of Great Britain. Parts xvii. and xviii. London: 1870.

The two customary parts of this beautiful work bear the dates of August 1st and September 1st. The species figured are mentioned under the families to which they belong.

HELE, N. FENWICK. Notes about Aldeburgh. London: 1870. 8vo, pp. 198.

Ornithology takes up about half of this book, the author of which has good opportunities for outdoor observation; and his records of capture include several species of considerable rarity in England.

HOMeyer, Eug. F. von. Beiträge zur Kenntniss der Vögel Ostsibiriens und des Amur-Landes. J. f. O. 1870, pp. 56-64, 161-175, 421-439.

The author's most useful summary of the works of Von Middendorff, Von Schrenck, and Radde is completed in these three articles, the whole series of which includes 322 species (Zool. Rec. vi. p. 35).

Koch, G. von. Ornithologische Notizen aus dem Jahre 1869. *Tom. cit.* pp. 393, 394.

Of local interest only.

Kuwert, A. Ornithologische Notizen. *Tom. cit.* pp. 203-206.

Notes made in East Prussia, and chiefly of local interest.

Malmgren, A. J. Zwei ornithologische Aufsätze. *Tom. cit.* pp. 281-305.

A translation of the two papers noticed last year (Zool. Rec. vi. pp. 35, 99).

——. Letter from. Ibis, 1870, pp. 148, 149.

Contains the substance of the first of the foregoing papers.

Marchand, A. Appendice au Catalogue des Oiseaux observés dans le Département d'Eure-et-Loire. R. Z. 1870, p. 139.

Adds six species, which makes the number observed in this Department 232 (*cf.* Zool. Rec. v. p. 42).

Möbius, K. Ein Besuch des Schleswig'schen Wattenmeeres und der Insel Sylt im März 1870. Zool. Gart. 1870, pp. 133-137.

Contains some good field-notes, particularly on the breeding of *Anas marila*.

Muth, J. P. Die Vögel auf Sicilien. *Tom. cit.* 1870, pp. 143-151.

A popular article, containing, however, some very good notes on some of the birds of Sicily.

Quistorp, G. Ornitholog. Mittheilungen aus Neu-Vorpommern. J. f. O. 1870, pp. 207-214.

Field-notes not calling for any special remark.

Sabanayeff, Leonida. Preavaritelnoï Oscherk Faunoï Posvonoschnoëch Srednyago Oorala. Bull. Mosc. xlii. 1870, pp. 185-197.

This paper contains preliminary remarks of great interest on the information respecting the fauna of the Ural, collected by the author during two journeys thither. He begins by giving a sketch of the various localities he visited, and then proceeds to

enumerate the different species found there, carefully defining those European species whose eastern range terminates at the Ural, and designating the Siberian species which extend to those mountains and their western slopes. As a curious circumstance, we may remark that he speaks of *Parus pendulinus* (p. 193) as occurring in the forest-region together with *Parus cyanus*. Among the species enumerated as occurring in the Central Ural (p. 195) are many of great rarity so far westward, as, for instance, *Lusciola calliope*, *Sylvia cyanura*, and *Regulus proregulus*. Space will not permit us to give a more extensive notice of this valuable contribution to the avifauna of the eastern frontier of Europe, and we look forward with interest to its continuation.

SARATZ, JEAN. Les Oiseaux de la Haute-Engadine. Bull. Soc. Orn. Suisse, ii. pp. 125-146.

Nearly twice as many (144) species as were noticed by Dr. Baldamus (Zool. Rec. iii. p. 52) are enumerated.

SCHACHT, H. Ein zweites Jahr der Beobachtung des Vogel-lebens im Teutoburger Walde. Zool. Gart. 1870, pp. 122-125.

In continuation of the paper before noticed (Zool. Rec. vi. p. 37).

SMITH, A. C. Narrative of a Spring Tour in Portugal. London: 1870. 8vo, pp. 220.

The author adds a chapter containing the substance of his former paper (Zool. Rec. v. p. 43), with Prof. du Bocage's corrections thereto (Zool. Rec. vi. p. 31), so as to form a very good guide to the ornithology of the country. (Cf. Ibis, 1870, p. 266; Zool. s. s. p. 2171.)

SNELL, F. H. Eine Parallele zwischen der Vogelfauna des Taunus und der Wetterau. Zool. Gart. 1870, pp. 77-84, 109-118.

The continuation of the author's previous paper (Zool. Rec. vi. p. 37), but of only local interest.

STEVENSON, H. The Birds of Norfolk, with remarks on their Habits, Migration, and Local Distribution. Vol. ii. London: 1870. 8vo, pp. 449.

The first volume was noticed four years since (Zool. Rec. iii. p. 52); and this continues the work to the end of the *Grallæ* in the same elaborate manner, each species in succession being very fully treated, the account of the extermination of *Otis tarda* being in particular given at great length. (Cf. Ibis, 1871, pp. 251, 252; Zool. s. s. pp. 2413-2423, 2453-2464.)

—. On the Meres of Wretham Heath. Tr. Norw. Soc. 1870, pp. 36-41.

An account of these meres, with notes on the birds observed there.

TACZANOWSKI, L. Uebersicht der Vögel die in Algerien, Provinz Constantine, während der Reise von Ende November 1866 bis Ende April 1867 gesammelt und beobachtet wurden. J. f. O. 1870, pp. 33–56. (Translated Zool. s. s. pp. 2573–2594.)

Two hundred and ten species were observed during the journey, which was made in company with Count Branicki.

—. Nachtrag zu Dr. Dybowski's Verzeichniss der im Gebiete von Darasun in Daurien beobachteten Vögel. *Tom. cit.* pp. 305–312.

Additions to and critical notes on the list of the birds of Darasun before noticed (Zool. Rec. v. p. 39).

TSCHUSI, VICTOR Ritter von. Ornithologischer Mittheilungen. *Tom. cit.* pp. 257–278.

Remarks on various birds of Austria, and some other subjects of less importance.

THURN, EVERARD F. IM. The Birds of Marlborough. Marlborough: 1870. 12mo, pp. 117.

The work of a schoolboy, very creditable to him, but naturally containing no new information of importance.

WHEELER, R. F. Meteorological Report for 1869. Tr. North. Durh. vol. iii. part 2, 1870.

Contains notes of the arrival of migratory birds in Northumberland, and also a list of dates on which certain species were known to breed in that county.

WRIGHT, C. A. Fourth Appendix to a List of Birds observed in Malta and Gozo. *Ibis*, 1870, pp. 488–493.

In continuation of former papers (Zool. Rec. vi. p. 38). *Sterna caspia* is recorded from Malta for the first time.

WYATT, CLAUDE W. Notes on the Birds of the Peninsula of Sinai. *Tom. cit.* pp. 1–18.

The author accompanied the Surveying-Expedition, and gives a list of the 84 species obtained by him and Mr. Holland.

ETHIOPIAN REGION.

BARBOZA DU BOCAGE, J. V. Aves das Possesões Portuguezas d'Africa occidental. Quarta lista. *Jorn. Sc. Lisb.* ii. pp. 333–352.

Adds much important information to our knowledge of the avifauna of Angola. One hundred and thirty-five species are

enumerated, of which six are described as new (see *Motacillidæ*, *Turdidæ*, *Oriolidæ*, *Laniidæ*, *Sturnidæ*, *Tetraonidæ*).

BARKLY, Sir HENRY. Notes on the Fauna and Flora of Round Island. Trans. R. Soc. Maur. n. s. vol. iv. p. 109.

A few general remarks on birds of the locality (p. 121).

BLANFORD, W. T. Observations on the Geology and Zoology of Abyssinia. London: 1869. 8vo, pp. 487, pls.

The author of this excellent book was Geologist to the late Abyssinian Expedition, and accompanied the troops to Magdala. He subsequently visited the Bogos Country in company with Mr. William Jesse, and on each journey collected such birds as he could. The ornithological portion of this work is considerable (pp. 285–443), 293 species being noticed, some of which are figured for the first time (see *Hirundinidæ*, *Sylviidæ*, *Alaudidæ*, and *Fringillidæ*). [Cf. *Ibis*, 1870, pp. 504, 505.]

FINSCH, O., & HARTLAUB, G. Baron C. C. von der Decken's Reisen in Ost-Afrika. Vierter Band. Die Vögel Ost-Afrika's. Leipzig und Heidelberg: 1870. Imp. 8vo, pp. 897.

This is the most important ornithological work of the year, and gives a very complete account of the birds of Eastern Africa. The knowledge of African ornithology possessed by one author, with the industry of the other, have combined, as might have been expected, to produce a volume which, so far as materials exist, exhausts the subject; and it would be impossible within any reasonable space to give an abstract of this work, a task the less necessary since the book must be possessed and constantly studied by every student of African ornithology. We cannot help regretting certain changes in nomenclature introduced by the authors, proceeding, we think, from a mistaken principle; but as these have been strongly censured elsewhere (*Ibis*, 1870, pp. 512, 513) and criticism is out of place in this 'Record,' we are glad to let them pass. They form, indeed, the only fault we have to find with an otherwise excellent book. The synonymy and geographical distribution of each species is worked out with extraordinary care; and the account of the *Grallæ* mentioned has been written with a completeness unequalled in any publication with which we are acquainted. The volume opens with an elaborate introduction (pp. 1–27), to which succeeds a notice of each species in detail (pp. 31–851), followed by a supplement and appendix containing information acquired during the progress of the work, which is illustrated by eleven plates representing new or unfigured species, and is completed by an excellent index. The number of species included is 457, of which, according to the authors' classification, 44 belong to *Accipitres*, 222 to *Passeres*, 23 to *Scansores*, 12 to *Columbæ*, 19 to

Gallinæ, 1 to *Struthiones* (an admirable dissertation), 90 to *Grallæ*, and the rest to *Natafores*.

FINSCH, O. On a Collection of Birds from North-Eastern Abyssinia and the Bogos Country. With notes by the collector, W. JESSE. Tr. Z. S. vii. pp. 197-331, pls. 24-27, with a map.

Mr. Jesse was zoologist to the Abyssinian Expedition, but was unable to follow the army into the interior. However, he joined Mr. Blanford (as above mentioned) in an excursion to the Bogos Country, where he formed the collection of which Dr. Finsch treats. It contained 221 species, two of which (belonging to *Laniidæ* and *Alaudidæ*) are described as new. In an appendix Mr. Jesse's 'Report,' noticed last year (Zool. Rec. vi. p. 40), is reprinted, and a second appendix contains some supplementary remarks, and gives a list of the species (101) obtained by Mr. Blanford, but not by Mr. Jesse.

HARTLAUB, G. [See FINSCH, O.]

HEUGLIN, M. T. VON. Ornithologie Nordost-Afrika's, der Nilquellen- und Küsten-Gebiete des Rothen Meeres und des nördlichen Somal-Landes. Lieferung 14-17. Cassel: 1870. Imp. 8vo, pp. 417-656, pls. vii., x., xi., xxv., b.

Four parts of this work appeared during the year and equal in merit those already noticed (Zool. Rec. vi. p. 40). The synonymy is carefully treated, and the excellent Latin diagnoses are worthy of all praise. The plates are fairly executed, and it is a pity that they are not published with the letterpress to which they refer.

JESSE, WILLIAM. [See FINSCH, O., and also BLANFORD, W. T.]

MELLISS, J. C. Notes on the Birds of the Island of St. Helena. Ibis, 1870, pp. 97-107.

Thirty-three species are enumerated, but, excluding Sea-birds, of which 8 visit or breed on the island, only one appears to be indigenous, all the rest being exotic.

PIKE, N. A visit to Round Island. Trans. R. Soc. Maur. n. s. vol. iv. p. 11, 1870.

Contains a few remarks on birds, but little ornithological information not previously known (*cf.* Ibis, 1861, p. 180).

SALVADORI, T. Rivista critica del catalogo descrittivo di una collezione di Uccelli fatta da Orazio Antinori nell' interno dell' Africa centrale nord dal maggio 1859 al luglio 1861. Atti Acc. Tor. 1870, pp. 719-746, pls. i., ii.

Contains remarks on about 70 species included in the Marquess's list, besides two others overlooked by him (*cf.* Ibis, 1870, pp. 518, 519).

SHARPE, R. B. On the Birds of Angola.—Part II. P. Z. S. 1870, pp. 142–150, pl. xiii.

The first part was noticed last year (Zool. Rec. vi. p. 41) : 21 species are included from Kattenbella, and 18 from the Rio Dande, 4 being recorded from Angola for the first time. One, belonging to *Laniidæ*, is new.

——. Contributions to the Ornithology of Madagascar.—Part I. *Tom. cit.* pp. 384–401, pl. xxix.

A list of 40 species collected in the northern part of the island by Mr. Crossley. Two new species, belonging to *Timaliidæ* and *Laniidæ*, are described ; the first is made the type of a new genus ; and a new genus of *Sylviidæ* is also founded.

——. On a fourth collection of Birds from the Fantee Country. *Ibis*, 1870, pp. 52–59, pls. ii. & iii.

——. On additional Collections of Birds from the Fantee Country. *Tom. cit.* pp. 470–488, pl. xiv.

In continuation of former articles on the same subject (Zool. Rec. vi. p. 41). In the first, 30 additional species are recorded, of which 11 are believed to have been met with in Fantee for the first time, and three new species are described (see *Nectariniidæ*, *Muscicapidæ*, *Fringillidæ*). In the second article 78 species not before included are noticed, of which 6 (belonging to *Strigidæ*, *Cypselidæ*, *Timaliidæ*, *Sylviidæ* (2), and *Fringillidæ*) are new. A list of additions to and corrections of the former lists is also given.

——. Critical remarks on Dr. von Heuglin's 'Ornithologie Nordost-Afrika's.' *Tom. cit.* pp. 421–435.—Further notes on the same. *Tom. cit.* p. 538.

Contains many additions to and corrections of the first thirteen Parts of the work reviewed.

——. On a new Muscicapine Bird from Madagascar. [*Muscicapidæ*.]

——. On the *Hirundinidæ* [q. v.] of the Ethiopian Region.

——. On the *Oriolidæ* [q. v.] of the Ethiopian Region.

INDIAN REGION.

BALL, V. Notes on Birds observed in the neighbourhood of Port Blair, Andaman Islands, during the month of August 1869. J. A. S. B. 1870, pp. 240–243.

Contains notes on twenty-two species of birds observed by the author.

BEAVAN, R. C. Additional Notes on some Indian Birds. *Ibis*, 1870, pp. 310–327.

The conclusion of the paper before noticed (Zool. Rec. vi.

p. 42), and the last we shall have from the author, whose early death is much to be deplored.

BLANFORD, W. T. List of Birds obtained in the Irawadi valley around Ava, Thayet Myo, and Bassein. *Tom. cit.* pp. 462-470.

The author's observations were carried on in the years 1861-62, and refer to 113 species.

——. Letter from. *Tom. cit.* p. 533.

Remarks on the limits of the so-called "Indian Region," and other notes on Birds (see *Sylviidae*).

BLYTH, E. Notes relating chiefly to the Birds of India. *Tom. cit.* p. 157.

Containing criticisms of some value on recent contributions to Indian ornithology; and the author, having examined the Leyden Museum, makes several identifications of species hitherto supposed to be distinct by Dutch and British writers. Two species (belonging to *Sylviidae*) are described for the first time.

ELWES, H. J. Letter from. *Tom. cit.* p. 526.

Relates to the ornithology of the Cardamum Hills of Travancore.

GODWIN-AUSTEN, H. H. A List of Birds obtained in the Khasi and North Cachar Hills. J. A. S. B. 1870, p. 91.

——. Second List of Birds obtained in the Khasi and North Cachar Hills, and the country at their base, in the Myensing and Sylhet districts. *Tom. cit.* p. 264.

In the first of these papers 207 species are enumerated, and interesting notes on some of them given. Very few *Gallinae* are included, and no *Grallae* or *Anseres*, these being poorly represented in the locality. In the second 148 additional species are mentioned.

GOULD, J. The Birds of Asia. Part xxii. London: 1870.

Of the sixteen species figured, many do not belong strictly to the Indian region.

HUME, ALLAN. Stray Notes on Ornithology in India. *Ibis*, 1870, pp. 181-185, 399-407.

The first of these papers describes a new genus and species of *Sylviidae* (q. v.), the second the habits of *Emberiza striolata*.

——. Letters from, on Indian Birds. *Tom. cit.* pp. 136, 145, 283, 435, 438, 528, 530, 532.

Innumerable remarks on Indian Ornithology, in the course of which several species are described as new (see *Falconidae* (3), *Indicatoridae*, *Muscicapidae*, *Sylviidae*, and *Motacillidae*), and others recorded for the first time as occurring in India.

——. Additional Observations regarding some species of Birds

noticed by Mr. W. T. Blanford in his "Ornithological Notes from Southern, Western, and Central India." J. A. S. B. 1870, pp. 113-122. (Cf. P. As. Soc. Beng. 1870, p. 85).

HUME, ALLAN. My Scrap Book. [See "ACCIPITRES."]

HUME, A. O. Letter from, on Birds obtained by Major Godwin-Austen [*ut supra*]. P. As. Soc. Beng. 1870, p. 265.

JERDON, T. C. Notes on some new species of Birds from the North-eastern frontier of India. *Tom. cit.* pp. 59-61. [See *Cypselidæ* and *Phasianidæ*.]

——. Letter from. *Ibis*, 1870, pp. 147, 148. [See *Phasianidæ*.]

SHARPE, R. B. On a Collection of Birds from China and Japan. With notes by the collector, Robert H. Bergman. *Ann. N. H.* (4) vi. pp. 157-161.

Only twenty-five species are enumerated.

STOLICZKA, F. A Contribution to Malayan Ornithology. J. A. S. B. 1870, pp. 277-334.

A carefully written paper based on a collection formed in the province of Wellesley, situated between Tenasserim and the well-known Malayan country about Malacca. Ninety-five species are noticed (*cf.* *Ibis*, 1871, p. 158).

SWINHOE, R. On the Ornithology of Hainan. *Ibis*, 1870, pp. 77-97, 230-256, 356-367, pls. iv., ix., x.

The author enumerates 172 species as being found in the islands of Hainan and Naochow, of which nineteen, belonging to *Falconidæ*, *Cypselidæ*, *Picidæ*, *Capitonidæ*, *Nectariniidæ*, *Campephagidæ*, *Turdidæ* (5), *Dicruridæ*, *Timaliidæ* (2), *Meliphagidæ*, *Paridæ*, *Sturnidæ* (2), and *Columbidæ*, are described as new.

——. Descriptions of three new species [*Turdidæ*, *Paridæ*, and *Rallidæ*] of Birds from China. *Ann. N. H.* (4) v. pp. 173-175.

——. On four new species of Birds [*Strigidæ*, *Cuculidæ*, and *Motacillidæ*] from China. *Op. cit.* (4) vi. pp. 152-154.

——. On the Pied Wagtails of China [*Motacillidæ*]. *P. Z. S.* 1870, pp. 120-129.

WALDEN, [ARTHUR HAY,] Viscount. Descriptions of some new species of Birds [*Strigidæ*, *Capitonidæ*, *Dicruridæ*, *Muscicapidæ*, *Turdidæ*, *Sylviidæ*, *Paridæ*] from Southern Asia. *Ann. N. H.* (4) v. pp. 218-220, 416-418.

——. On the Sun-birds [*Nectariniidæ*] of the Indian and Australian Regions. *Ibis*, 1870, pp. 18-51, pl. i.

AUSTRALIAN REGION.

BULLER, W. Notes on the Ornithology of New Zealand. Tr. N. Z. Inst. ii. pp. 385-392.

——. Remarks on some disputed species of New-Zealand Birds. Ibis, 1870, pp. 455-460.

The substance of these papers is substantially identical, and forms a reply to Dr. Finsch's criticisms [Zool. Rec. vi. p. 44].

——. Critical notes on the Ornithological portion of Taylor's "New Zealand and its Inhabitants." Tr. N. Z. Inst. iii. pp. 11-14.

Several inaccuracies are pointed out in the work criticized.

——. Further notes on the Ornithology of New Zealand. *Tom. cit.* pp. 37-56, pl. xii.b.

Among other remarks, some identifications of synonymy are made. The plate represents some details of the structure of *Apteryx*.

DIGGLES, SYLVESTER. The Ornithology of Australia. Queensland. Imp. 4to. Part XXI., pls.

The only part of this work that has reached us since it was last noticed (Zool. Rec. v. p. 51).

DOLE, SANDFORD B. A Synopsis of the Birds hitherto described from the Hawaiian Islands. P. Bost. Soc. xii. pp. 294-309.

Forty-eight species enumerated, which number the author considers to be little more than half the avifauna of the group. [Cf. Ibis, 1871, p. 356.]

FINSCH, O. Ueber die Vögel Neu-Seelands. J. f. O. 1870, pp. 241-256, 321-377.

Notes on further collections received from Dr. Haast. One hundred and fifty-five species are enumerated.

FINSCH, O., & HARTLAUB, G. Zur Ornithologie der Tonga-Inseln. *Tom. cit.* pp. 119-140.

A full account of the collection made by Dr. Gräffe (Zool. Rec. vi. p. 44). Thirty-seven species are enumerated, and notes on 18 given.

GRÄFFE, E. Ornithologische Mittheilungen aus Central-Polynesien. I. Die Vogelwelt der Tonga-Inseln. *Tom. cit.* pp. 401-420.

Field-notes on the birds, to be read in connexion with the paper last noticed.

GREY, Sir G. Letter on Moa-bones. P. Z. S. 1870, p. 116.

Relates to Dr. Haast's communication (*vide infra*).

HAAST, F. Letter on the discovery of Cooking-pits and Kitchen-middens in New Zealand. *Tom. cit.* p. 53.

Contains notes on remains of different species of *Dinornis*. Prof. Owen adds some remarks.

HARTLAUB, G., & FINSCH, O. On *Lobiospiza notabilis*, a remarkable new Finch [*Fringillidæ*] from the Navigator's Islands. *Tom. cit.* p. 817, pl. xlix.

HUTTON, F. W. Notes on some of the Birds inhabiting the Province of Auckland, New Zealand. *Ibis*, 1870, pp. 392-398.

Chiefly relates to the breeding of certain birds; but five species of *Procellariidæ* are added to the New-Zealand fauna, and a list of acclimatized birds is appended.

—. Description of two Birds [*Procellariidæ*] new to the Fauna of New Zealand. *Tr. N. Z. Inst.* ii. pp. 78-80.

POTTS, T. H. On the Birds of New Zealand. *Tom. cit.* pp. 40-80, pls. iv.-vi. [See "Oology."]

WALDEN, ARTHUR [HAY], Viscount. On the Sun-birds of the Indian and Australian Regions. [See *Nectariniidæ*.]

NEARCTIC REGION.

BAIRD, S. F., & COOPER, J. G. Geological Survey of California. Ornithology. Vol. I. Land Birds. Cambridge [U.S.]: 1870. Royal 8vo, pp. 592.

A very useful handbook for Californian ornithologists, but rather disappointing to the general student.

BANNISTER, B. H. A Sketch of the American *Anserinæ*. [See *Anatidæ*.]

COOPER, J. G. [See BAIRD, S. F.]

RIDGWAY, R. A new classification of the North-American *Falconidæ* [q. v.] &c.

NEOTROPICAL REGION.

DUGÈS, ALFREDO. Catálogo de animales vertebrados observados en la República Mexicana. *Nat. Mex.* i. pp. 138-143.

One hundred and eighty-nine species of birds are mentioned, with the Spanish and Mexican names of many of them.

ERNST, A. Apuntes para la Fauna Ornitologica de Venezuela. Vargas. 1870, No. 7, pp. 195-198, pl. i.

An abstract of Messrs. Sclater and Salvin's papers on Venezuelan birds (*Zool. Rec.* v. p. 57, vi. p. 52).

1870. [VOL. VII.]

FINSCH, O. On a Collection of Birds from the Island of Trinidad. P. Z. S. 1870, pp. 552-589.

The collection comprised 115 species, which are noticed at length, occasion being taken to correct some errors in Léotaud's work (Zool. Rec. iii. p. 63). Synonymy receives careful attention; and one species (*Fringillidæ*) receives a new name. About 350 species have occurred in Trinidad.

——. Ueber eine Vögelsammlung aus Nordwest-Mexico. Abh. Ver. Brem. 1870, pp. 321-363.

The collection contained 44 species (one of which, belonging to *Corvidæ*, is new), elaborate notes on most of which are given in the author's accustomed manner, those on *Otocorys* being especially praiseworthy.

HOLTZ, L. Beschreibung südamerikanischer Vogel-Eier. [See "Oology."]

HUDSON, W. H. Letters on the Ornithology of Buenos Ayres. P. Z. S. 1870, pp. 87-89, 112-114, 158-160, 332-334, 545-550, 671-673, 748-750, 798-802.

Contains a variety of miscellaneous information. The most important subject treated is perhaps the habits of *Colaptes campestris*, which has called forth a note from Mr. Darwin. [See *Picidæ*.]

PELZELN, A. VON. Zur Ornithologie Brasiliens. Resultate von Johann Natterer's Reisen u. s. w. III. Abtheilung. Wien: 1870. 8vo, pp. 189-462, and map.

This continues the important work before noticed (Zool. Rec. v. p. 55, vi. p. 51). The whole number of species included is 515, of which 20 (belonging to *Picidæ*, *Tanagridæ*, *Fringillidæ*, *Icteridæ*, *Columbidæ*, and *Cracidæ*) are in this part described as new. Then follows an excellent treatise on the natural divisions of Brazil as determined by its ornithology. Four subregions, the Columbian, Amazonian, South-Brazilian, and Chileno-Patagonian, are established, and their limits traced on the accompanying map, the characteristic species of each being shown by tables. [Cf. Ibis, 1870, pp. 272-274.]

PENAFIEL, ANTONIO. [See VILLADO, MANUEL M.]

REINHARDT, J. Bidrag till Kundskab om Fuglefaunen i Brasiliens Campos. Vid. Med. 1870, pp. 1-267, tab. viii.

A careful list of birds found on the plains of Brazil, compiled from materials obtained by the author and Dr. P. W. Lund. Three hundred and ninety-three species are enumerated, two of which [*Tyrannidæ*] are described as new.

SALVIN, O. On some Collections of Birds from Veragua. Part II. P. Z. S. 1870, pp. 175-219, pl. xvii.

In continuation of the paper formerly noticed (Zool. Rec. iv. p. 69). Two hundred and sixteen species are added to the avifauna of Veragua, of which nine (belonging to *Picidae*, *Caprimulgidae*, *Cypselidae*, *Trochilidae*, *Cotingidae*, *Tyrannidae*, *Troglodytidae*, and *Tanagridae*) are new; and the plate gives a useful map of the country.

SALVIN, O. Additional notes on Mr. Lawrence's List of Costa-Rica Birds. Ibis, 1870, pp. 108-116.

In continuation of the paper noticed last year (Zool. Rec. vi. p. 51). Five hundred and twenty species are believed to have been met with in the country; but there are doubtless others to be added.

—. [See SCLATER, P. L., & SALVIN, O.]

SANCHEZ, JESUS. [See VILLADO, MANUEL M.]

SCLATER, P. L. On some new or little-known Birds from the Rio Paraná. P. Z. S. 1870, pp. 57, 58, pl. iii.

Brief remarks on several species, one of which [*Tyrannidae*] is new, and another [*Dendrocolaptidae*] is figured.

—. Notices of some new or little-known Species of South-American Birds [*Picidae*, *Cypselidae*, *Dendrocolaptidae*, *Troglodytidae*]. Tom. cit. pp. 328-330.

SCLATER, P. L., & SALVIN, O. Characters of new Species of Birds collected by Dr. Habel in the Galapagos Islands [*Fringillidae* and *Ardeidae*]. Tom. cit. pp. 322-327.

A list of the species, 37 in number, obtained by the collector is prefixed.

—, —. On some recent additions to the Fauna of Mexico. Tom. cit. pp. 550, 551.

Five species are enumerated.

—, —. On Venezuelan Birds collected by Mr. A. Goering. [Cf. Zool. Rec. 1869, p. 52.] Tom. cit. pp. 779-788, pls. xlv., xlvii.

In continuation of former papers (Zool. Rec. v. p. 57, vi. p. 52). The 106 species now enumerated were obtained in the Sierra Nevada of Merida, and 9 (belonging to *Psittacidae*, *Formicariidae*, *Cerebidae*, *Tyrannidae*, *Mniotiltidae*, and *Tanagridae*) are new.

—, —. On Birds collected by Mr. George M. Whitely on the coast of Honduras. Tom. cit. pp. 834-839.

One hundred and thirty-five species were obtained, but none of very special interest.

—, —. Descriptions of five new Species of Birds from the

- United States of Columbia [*Trogonidæ*, *Dendrocolaptidæ*, *Tyrannidæ*, *Fringillidæ*]. *Tom. cit.* pp. 840-844, pl. liii.
- SCLATER, P. L., & SALVIN, O. Third list of Birds collected during the Survey of the Straits of Magellan, by Dr. Cunningham. *Ibis*, 1870, pp. 499-501.
- In continuation of articles before noticed [*Zool. Rec.* v. p. 54, vi. p. 53], enumerating 33 species. [See also "OOLOGY."]
- SUNDEVALL, C. J. Foglarne på ön S:t Barthelemy, efter de af Dr. A. von Goës hemsända samlingarna bestämde. *Öfv. Sv. Ak.* 1869, pp. 579-592.
- . Foglarne på ön Portorico, efter Hr. Hjalmarsons insamlingar framställda. *Tom. cit.* pp. 593-604.
- Both papers worthy of their author.
- VILLADA, MANUEL M., PENAFIEL, A., & SANCHEZ, J. Aves del Valle de México. *Nat. Mex.* i. pp. 94-100, 146-154.
- Contains the introductory portion only.

ANATOMY AND PHYSIOLOGY.

- CAMPANA, M. De la texture et des caractères différentiels du poumon chez les oiseaux. *C. R.* 1870, pp. 458-461, 525-529.
- MÄKLIN, F. W. Hvita varieteter eller s.k. Albinos i Universitetets zoologiska samlingar. *Öfv. Fin. Soc.* xii. pp. 96-101.
- On albinos of several species of birds in the Helsingfors museum.
- MAGNUS, HUGO. Untersuchungen über den Bau des knöchernen Vogel-Kopfes. *Z. wiss. Zool.* 1870, pp. 1-108, Taf. 1-6.
- A contribution valuable with reference to Prof. Huxley's researches [*Zool. Rec.* iv. p. 46].
- MARTIN, L. Das Abändern der Luftröhre beim Auerhahn (*Tetrao urogallus*). *Zool. Gart.* 1870, pp. 24-28.
- MORRELL, G. H. The Student's Manual of Comparative Anatomy and Guide to Dissection. Part II. Sect. 1, *Aves*. 1870.
- A popular exposition, for beginners, of Prof. Huxley's views in classification, with a short description of the osteology, and the digestive and circulatory systems in Birds. Practical hints (which are good) for young dissectors are also given. [*Cf. Ibis*, 1870, p. 508.]
- ROLLESTON, GEORGE. Forms of Animal Life [*vide supra*, p. 4].
- Columba livia* is the species described as the representative of the class.
- SELENKA, EMIL. Sur la morphologie des muscles de l'épaule chez les oiseaux. *Arch. Néerl.* v. pp. 48-54, pl. 2. [See also "GENERAL SUBJECT."]

STÖLKER, CARL. Abnormitäten in meiner ornithologischen Sammlung. J. f. O. 1870, pp. 89–91.

Contains some notes on albinos and melanisms.

NEOSSOLOGY.

BETTONI, EUGENIO. Storia Naturale degli Uccelli che nidificano in Lombardia, &c. [See "PALÆARCTIC REGION."]

The young of *Picus minor*, *Hypolais polyglotta*, *Columba livia*, *Pavo cristatus*, *Meleagris gallopavo*, *Numida meleagris*, *Lagopus mutus*, *Porzana maruetta*, *Sterna hirundo*, *Lyrurus tetrax*, *Anas boschas*, *Lanius excubitor*, *Certhia familiaris*, *Actitis hypoleucos*, *Parus ater*, *Crex pratensis*, *Cuculus canorus*, *Palumbus columbella*, *Perdix saxatilis*, *Turdus musicus*, *Gallinula chloropus*, *Emberiza cia*, *Gavia ridibunda*, *Cygnus olor*, *Anser cinereus*, *Cairina moschata*, *Phyllopneuste rufa*, and *Merops apiaster* are figured.

GOULD, J. The Birds of Great Britain. [See "PALÆARCTIC REGION."]

Part xvii. contains figures of the nestlings of *Limonites temmincki*; Part xviii. those of *Otocorys alpestris*, *Glareola pratincola*, and *Himantopus candidus*.

MARCHAND, ALB. Poussins des oiseaux d'Europe couverts de duvet à la sortie de l'œuf. R. Z. 1870.

The species represented are:—*Circus rufus*, pl. 2; *C. cineraceus*, pl. 3; *Strix otus*, pl. 4; *Uria troile*, pl. 6; and *Anas strepera*, pl. 7.

OOLOGY.

BETTONI, EUGENIO. Storia Naturale degli Uccelli che nidificano in Lombardia, &c. [See "PALÆARCTIC REGION."]

Plate V. contains figures of the eggs of *Accipiter nisus* (6), *Buteo cinereus* (4), *Tinnunculus alaudarius* (5), *Circus æruginosus* (2), *Otus vulgaris* (2), *Curruca orphea* (4), *Emberiza citrinella* (4), *Hypolais polyglotta* (3), *Hypolais salicaria* (2), *Dendronanthus arboreus* (4), *Enneoctonus rufus* (8), *Enneoctonus colurio* (8); and Plate VI. :—

Ruticilla phœnicura (2), *Prunella modularis* (2), *Accentor alpinus* (1), *Turdus musicus* (3), *Acanthis linaria* (3), *Carduelis elegans* (2), *Phyllopneuste bonelli* (1), *Coccothraustes vulgaris* (2), *Anthus spinoletta* (2), *Motacilla alba* (2), *Hortulanus chlorocephalus* (3), *Ruticilla tithys* (2), *Emberiza cia* (4), *Curruca hortensis* (2), *Picus minor* (2), *Oriolus galbula* (3), *Porzana maruetta* (2), *Lanius excubitor* (1), *Anas boschas* (1), *Syrnium aluco* (1), *Lophortyx californica* (3), *Sterna hirundo* (5), *Actitis hypoleuca* (3), *Crex pratensis* (2).

HOCKER, J. Ueber das Abändern der Eier. J. f. O. 1870, pp. 397, 398.

On the absence of colour occasionally shown.

HOLTZ, L. Beschreibung südamerikanischer Vogel-Eier. J. f. O. 1870, pp. 1-24, Taf. 1.

The eggs of 44 species are described, and those of *Molobrus sericeus* (5), *M. badius* (3), and *Opisthocomus cristatus* (2) figured.

HUME, ALLAN. My Scrap-Book. [See "ACCIPITRES."]

HUTTON, F. W. Notes on some of the Birds inhabiting the province of Auckland, New Zealand. [See "AUSTRALIAN REGION."]

The nests and eggs of several species are described.

NEWTON, ALFRED. Additional Note on the Nests and Eggs collected by Dr. Cunningham. Ibis, 1870, pp. 501-504.

The nests or eggs of 14 or 15 species of South-American birds are described.

POTTS, T. H. On the Birds of New Zealand. Tr. N. Z. Inst. ii. pp. 40-80, pls. 4-6.

Good accounts of the breeding-habits, nests, or eggs of 53 species. The plates represent some remarkable nests.

REICHENOW, ANTON. Ueber die Bedeutung der Eier-Maassen. J. f. O. 1870, pp. 385-392.

Gives careful maximum and minimum measurements of the eggs of nearly 60 European species.

ACCIPITRES.

ALLÉON, AMÉDÉE, & VIAN, JULES. Des migrations des oiseaux de proie sur le Bosphore de Constantinople. R. Z. 1870, pp. 60-66, 81-86, 129-138, 161-165.

In continuation of the former articles (Zool. Rec. vi. p. 59).

HUME, ALLAN. My Scrap-Book; or, Rough Notes on Indian Oology and Ornithology. Calcutta: 1870. 8vo, pp. 239-342.

This second portion (*cf.* Zool. Rec. vi. p. 56) completes the Indian *Accipitres*, and includes descriptions of three new species, the characters of which had previously been published (Ibis, 1870, pp. 438, 439).

SCHACHT, H. Die Raub- und Würgvögel des Teutoburger Waldes. Zool. Gart. 1870, pp. 173-181, 214-224.

Contains notes on the habits of some species.

CATHARTIDÆ.

Cathartes aura and *C. urubu*, notes on. A. Herrera, Nat. Mex. i. p. 17.

VULTURIDÆ.

Gyps kolbi is distinct from *G. fulvus*. E. Blyth, Ibis, 1870, p. 156.

Neophron ginginianus (Zool. Rec. ii. p. 91) is doubtfully distinct from *N. percnopterus*. W. E. Brooks, *tom. cit.* p. 291.

FALCONIDÆ.

Spilornis rutherfordi is a new species from Hainan and Siam, distinguished from *S. cheela* by its smaller size and less robust tarsi, and from *S. bido* by the under surface being less distinctly barred. R. Swinhoe, *tom. cit.* pp. 85, 86.

Aquila chrysaetus in Norfolk. H. Stevenson, Tr. Norw. Soc. 1870, p. 59.

Aquila naevioides occurs in India. H. B. Tristram, P. Z. S. 1870, p. 4.

Aquila desmursi, Verr. (1857), is identical with *A. wahlbergi*, Sundev. (1850). O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 51.

Aquila nœvia and *Pandion haliaetus* are figured. J. Gould, B. Gt. Br. pt. xvii.

Haliaetus brooksi is a supposed species from India, which may prove to be *H. pelagicus*. A. Hume, Ibis, 1870, p. 438; Scrap-Book, p. 255.

Buteo auguralis [Zool. Rec. iii. p. 73] in Benguela. J. V. B. du Bocage, Journ. Sc. Lisb. ii. p. 335.

Buteo vulgaris, its food. K. T. Liebe, Zool. Gart. 1870, p. 97.

Buteo melanosternon is figured. S. Diggles, Orn. Austr. pt. xxi.

Circus gouldi, Bp., identified with *C. assimilis*; but the first name should stand. J. H. Gurney, Ibis, 1870, p. 536.

Milvus major is described as a new species from India. A. Hume, *tom. cit.* p. 439; Scrap-Book, p. 326.

Milvus regalis breeding in confinement. A. Naumann, Zool. Gart. 1870, p. 318.

Elanus cœruleus, breeding-habits described. G. E. Shelley, Ibis, 1870, p. 149. RIDGWAY, R. A new classification of the North-American *Falconidæ*, with descriptions of three new species. P. Ac. Philad. 1870, pp. 138-150.

An elaborate paper, worked out by means of a large series of specimens. The new species are:—

Falco (Hypotriorchis) richardsoni, said to have been hitherto confounded with *F. columbarius* (p. 145),

Falco (Tinnunculus) leucopteryx, from Cuba and St. Domingo; allied to *F. sparverioides*, but white underneath (p. 147),

And a bird for which is proposed the new genus

Onychotes, the type being *O. grueberi*, from California (?), not unlike *Buteo fuliginosus* in appearance, and easily to be mistaken for it (p. 149).

Falco islandicus inhabits Alaska. Alfred Newton, P. Z. S. 1870, p. 384.

Falco concolor, Temm.: ad., jun., and egg figured. O. Finsch & G. Hartlaub, Vog. Ost-Afr. frontisp.

Hieracidea brunnea is distinct from *H. novæ-zelandiæ*. J. H. Gurney, Ibis, 1870, p. 534.

Astur atricapillus has occurred in Scotland, R. Gray, Ibis, 1870, p. 292; in Ireland, V. Brooke, *tom. cit.* p. 538.

Astur macrurus is figured. R. B. Sharpe, *tom. cit.* pl. iii.

Accipiter brevipes and *A. gabar* (?) * near Constantinople. J. H. Elwes & T. E. Buckley, *tom. cit.* p. 75.

Accipiter nisoides is distinct from *A. virgatus*. E. Blyth, *tom. cit.* p. 158.

* Qu. *A. niloticus*? cf. Blanford, Zool. & Geol. Abyss. p. 292.

Nisus badius and its allies. O. Finsch and G. Hartlaub, Vög. Ost-Afr. pp. 81-85; R. B. Sharpe, *tom. cit.* p. 424.

Asturina is a new generic name proposed instead of *Kaupifalco*, Bonaparte. O. Finsch and G. Hartlaub, Vög. Ost-Afr. p. 59.

Asturina polionota, Cab., is *A. plagiata*, Schl. O. Salvin, Ibis, 1870, p. 113.

STRIGIDÆ.

Phasmopteryx capensis in Sinai, C. W. Wyatt, Ibis, 1870, p. 11; near Tangiers, Ld. Lilford, P. Z. S. 1870, p. 2.

Ephialtes jerdoni is a new species from Malabar, differing from *E. lempiji* by its ruddy plumage and nearly unspotted tarsal feathers. Ld. Walden, Ann. N. H. (4) v. p. 418.

Ephialtes glabripes and *E. hambroeki* are described as new species from Formosa. The first also occurs in Southern China, and is allied to *E. semitorques*, T. & S., of Japan, but having bare toes. R. Swinhoe, *op. cit.* vi. pp. 152, 153.

Ephialtes umbratilis is a new species from Hainan, allied to *E. griseus*, Jerd., but having a longer tarsus and toes and no white spot on the underneck. *Id.* Ibis, 1870, p. 342, note.

Ephialtes plumipes is a new species from India, as large as *E. lettia*, but with feathered toes. A. Hume, *tom. cit.* p. 439; Scrap-Book, p. 397.

Scops pennatus, *Athene brodiei*, *Syrnium ocellatum*, and *Phodilus badius* are figured. J. Gould, B. As. part xxii.

Syrnium nuchale is a new species from Fantee, resembling *S. woodfordi*, but darker. R. B. Sharpe, Ibis, 1870, p. 487.

Nyctea nivea breeding in Labrador. H. S. Hawkins, *tom. cit.* p. 299.

Strix uralensis in the Austrian dominions. V. v. Tschusi, J. f. O. 1870, p. 257.

PSITTACI.

STRIGOPIDÆ.

Strigops habroptilus. An example in confinement. P. L. Sclater, P. Z. S. 1870, p. 798; P. W. Wood, Stud. 1870, p. 492, pl.

ARIDÆ.

Palaornis torquatus is distinct from *P. cubicularis*. E. Blyth, Ibis, 1870, p. 162.

Polytelis alexandrae is figured. S. Diggles, Orn. Austr. pl.

Conurus rhodocephalus is a new species from Venezuela, allied to *C. roseifrons*, but wanting the red rump and brown throat. P. L. Sclater & O. Salvin, P. Z. S. 1870, p. 787.

PSITTACIDÆ.

Urochroma dilectissima is a new species from Venezuela, remarkable for its scarlet outer wing-coverts. P. L. Sclater & O. Salvin, P. Z. S. 1870, p. 788, pl. xlvii.

Ponias fuscicapillus, Verr., s figured. O. Finsch & G. Hartlaub, Vög. Ost-Afr. tab. vii.

TRICHOGLOSSIDÆ.

Nestor productus in Italian museums. E. de Selys-Longchamps, Ibis, 1870, p. 450.

PICARIÆ.

PICIDÆ.

Colaptes campestris. Mr. Darwin's statements as to its habits contradicted. W. H. Hudson, P. Z. S. 1870, pp. 158-160.—Reply to the same. C. Darwin, *tom. cit.* p. 705.

Chloronerpes simplex and *Melanerpes chrysauchen* are new species from Veragua: the former resembling *C. aurulentus*, but with a differently coloured head; the latter, like *M. flavifrons*, but having the lores and nape yellow, and only the lower part of the belly crimson. O. Salvin, *tom. cit.* pp. 212, 213.

Melanerpes pulcher is a new species from Bogotá, allied to *M. chrysauchen* (*ut infra*), but with transverse bands from the breast to the vent. P. L. Sclater, *tom. cit.* p. 330.

Micropternus holroydi is a new species from Hainan, nearly allied to *M. fokiensis*; but the wings and tail are shorter, and the head and neck different. R. Swinhoe, Ibis, 1870, p. 96.

Picus westermanni is indicated as a new species resembling *P. macæi*. E. Blyth, *tom. cit.* p. 163.

Picumus borbæ, "*P. aurifrons*, Natterer," "*P. leucogaster*, Natt.," and "*P. fuscus*, Natt.," are new species from Brazil. The first is like *P. leucogaster*, Sundev., but smaller, and having an olive-coloured back. A. v. Pelzeln, Orn. Bras. pp. 334, 335.

Vivia innominata, *Sasia ochracea*, and *S. abnormis* figured. J. Gould, B. As. part xxii.

TROGONIDÆ.

Trogon chionurus is a new species from Panama, hitherto confounded with *T. viridis*, with which, however, *T. venustus*, Cab. & Heine, is identical. P. L. Sclater & O. Salvin, P. Z. S. 1870, p. 843.

GALBULIDÆ.

Brachygalba goeringi (Zool. Rec. vi. p. 63) figured. A. Ernst, Vargas. 1870, pl. i.

ALCEDINIDÆ.

SHARPE, R. B. A Monograph of the *Alcedinidæ* or Kingfishers. London. Parts vii.-xiii. Roy. 8vo.

Five parts, one of them a double one, of this work have been published during the year (Zool. Rec. vi. p. 64). Part vii. (1 Jan.) contains figures and descriptions of *Ceryle torquata*, *Alcedo grandis*, *Alcyon pulchra*, *Halcyon cyanoventris*, *H. albiventris*, *H. senegalensis*, *H. malimbica*, and *Dacelo leachi*. In part viii. (1 April) are included *Pelargopsis amauroptera*, *P. leucocephala*, *P. gouldi* (*vide infra*), *P. burmanica*, *P. floresiana*, *Ceyx sharpii*, *Dacelo cervina*, *D. occidentalis*. Part ix. (1 July) contains *Pelargopsis melanorhyncha*, *Alcedo euryzona*, *A. bengalensis*, *Halcyon coromanda*, *H. gularis*, *H. erythro-*

gaster, *H. lazuli*, and *Tanysiptera hydrocharis*. Parts x. and xi. (1 Oct.) include *Alcedo moluccensis*, *A. asiatica*, *Alcyon azurea*, *Ceryle americana*, *Ceyx dillwyni*, *Halcyon smyrnensis*, *H. diops*, *H. macleayi*, *H. nigrocyanea*, *H. concreta*, *H. pyrrhopygia*, *H. sordida*, *H. cinnamomina*, *Monachalcyon monachus*, *Tanysiptera margarethæ*, *Dacelo gigas*. Part xii. (1 Nov.) gives *Pelargopsis gurali*, *Halcyon semicærulea*, *H. chloris*, *H. forsterii*, *H. sancta*, *Todirhamphus recurvirostris*, *Tanysiptera acis*, *T. doris*. Part xiii. comprises *Alcedo ispida*, *A. quadribrachys*, *Halcyon chelicutensis*, *H. australasie*, *H. funebris*, *H. sacra*, *Todirhamphus veneratus*, *T. tutus*. [Cf. J. f. O. 1870, p. 377.]

SHARPE, R. B. On the genus *Pelargopsis*, Gloger. P. Z. S. 1870, pp. 61–66.

An attempt to arrange this group, the species of which had been much confounded. Of the eight species determined three are described as new, namely:—

P. gouldi, from Manilla, *P. burmanica*, from Burmah, and *P. floresiana*, from Flores, all allied to *P. leucocephala*; but the first is green instead of blue, the second has a light grey cap, and the head of the third has a greenish lustre. The Javan *P. capensis* (L.) receives a new name, *P. fraseri*; and the Malacca race of *P. gurali* is distinguished as *P. malaccensis*.

CUNNINGHAM, R. O. Notes on some Points in the Anatomy of three Kingfishers (*Ceryle stellata*, *Dacelo gigas*, and *Alcedo ispida*). Tom. cit. pp. 280–283, pl. xxiv.

Relates principally to a peculiarity in the superficial muscles of the back of the neck in *C. stellata*.

Alcedo grandis is figured. J. Gould, B. As. pt. xxii.

Halcyon pyrrhopygia and *H. sordidus* are figured. S. Diggles, Orn. Austr. pt. xxi.

Halcyon sanctus in Tasmania. H. J. Swan, P. R. Soc. Tasm. 1869, p. 7.

CAPITONIDÆ.

MARSHALL, C. H. T. & G. F. L. Notes on the Classification of the *Capitonidæ*. P. Z. S. 1870, pp. 117–120.

A sketch of the classification to be adopted in the authors' larger work (*vide infra*). Several genera are abolished, and a new one, *Stactolema*, established for *Buccanodon anchietæ* (Zool. Rec. vi. p. 65).

— A Monograph of the *Capitonidæ* or Scansorial Barbets. London: 1871. Parts i.–vi. Roy. 8vo.

A very meritorious and useful undertaking. The fifth part contains an introduction, beginning with a dissertation on the theory of evolution, followed by an account of the literature relating to the group, and then a chapter on its classification and distribution. The species figured are:— Part I. *Megalæma virens*, *M. versicolor*, *M. henrici*, *Calorhamphus lathamii*, *Tricholæma hirsuta*, *Trachyphonus margaritatus*, *Capito maculicoronatus*, *C. aurovirens*. Part II. *Pogonorrhynchus dubius*, *Tetragonops frantzii*, *Xylobucco duchaillii*, *Trachyphonus cafer*, *Capito bourcierii*, *Megalæma lineata*, *M. hodgsoni*, *M. flavifrons*. Part III. *Megalæma zeylanica*, *M. caniceps*, *M. nuchalis*, *M. faber* (*vide infra*), *M. australis*, *Xantholæma rubricapilla*, *Stactolæma anchietæ*, *Pogonorrhynchus leucocephalus*. Part IV. *Megalæma viridis*, *M. asiatica*, *M. oorti*, *M. phæostriata*, *Trachyphonus goffini*, *T. purpuratus*, *T.*

equamiceps, *Barbatula leucotis*. Part V. *Megalæma chrysopogon*, *Xantholæma hæmacephala*, *Capito aurantiicollis*, *Psilopogon pyrolophus*, *Calorhamphus fuliginosus*, *Pogonorhynchus abyssinicus*, *P. torquatus*, *P. bidentatus*.

Megalæma franklinii is figured. J. Gould, B. As. part xxii.

Megalæma inornata is a new species from South-western India, allied to *M. caniceps*, but distinguished by the uniform pale brown of the lower surface. Lord Walden, Ann. N. H. (4) v. p. 219.

Megalæma marshallorum is a new name given to the Himalayan species hitherto confounded with the Chinese *M. viridis* (Bodd.). R. Swinhoe, *op. cit.* vi. p. 348.

Megalæma faber is a new species from Hainan, like *M. nuchalis* from Formosa, but differing in the colouring of the head. *Id.* Ibis, 1870, p. 97, pl. iv. fig. 1.

Megalæma humii is a new species from Borneo, hitherto confounded with *M. mystacophonus*. C. H. T. & G. F. L. Marshall, *tom. cit.* p. 536.

Capito hartlaubi, *C. sulphureus*, and *C. melanotis* are the females of *C. bourcierii*, *C. richardsoni*, and *C. aurantiicollis* respectively. O. Salvin, *tom. cit.* pp. 111-113.

BUCEROTIDÆ.

Buceros subcylindricus is a new species from Western Africa, allied to *B. cylindricus* and *B. fistulator*, but differing from the former in the colouring of the tail, from the latter by the white inner secondaries, from both by its white-spotted head. P. L. Sclater, P. Z. S. 1870, p. 668, pl. xxxix.

UPUPIDÆ.

Upupa epops has occurred in Spitsbergen. R. Collett, Ibis, 1870, p. 539.

Irrisor sibilator, *I. caudacutus*, *I. lamprolophus*, *I. cæruleus*, and *I. cyaneus* are supposed to be spurious species. O. Finsch & G. Hartlaub, Vög. Ost-Afr. pp. 210, 211.

MUSOPHAGIDÆ.

Corythaix livingstonii is figured. O. Finsch & G. Hartlaub, Vög. Ost-Afr. tab. viii.

Schizorhis personata figured. T. v. Heugl. Orn. Nordost-Afr. tab. xxv. b.

COLIIDÆ.

Hypocolius [cf. Zool. Rec. v. p. 80] seems to belong to this family. E. de Selys-Longchamps, Ibis, 1870, p. 450.

CUCULIDÆ.

Eudynamis malayana compared with its allies. R. Swinhoe, Ibis, 1870, p. 231.

Cuculus michieanus is a new species from Szechuen. *Id.* Ann. N. H. (4) vol. vi. p. 153.

SCLATER, P. L. Further notes on the Cuckoos of the genus *Coccyzus*. P. Z. S. 1870, p. 165.

A synonymatic list of the 8 species known, with the addition of some facts acquired since the author last treated the subject. [Zool. Rec. i. p. 72.]

Coccyzus erythrophthalmus at Lucca. E. de Selys-Lonchamps, Ibis, 1870, p. 452.

Coccyzus americanus in Wales. G. W. Cosens, Zool. s. s. p. 2407.

SCCLATER (P. L.). Note on the Systematic Position of *Indicator*. Ibis, 1870, pp. 176-180.

The osteology of *I. minor* shows a greater affinity to *Capitonidæ* than to *Cuculidæ*, and the group should probably be placed near the former as a distinct family "INDICATORIDÆ." [cf. W. T. Blanford, Geol. & Zool. Abyss. pp. 308, 309.]

Indicator radcliffii is a supposed new species from the Huzara country, allied to *I. xanthonotus* but of a deeper brown, and with the back of a paler yellow. A. Hume, tom. cit. p. 529.

CAPRIMULGIDÆ.

Antrostomus saturatus is a new species from Veragua, resembling *A. nigrescens*, but having no yellow band or alar speculum. O. Salvin, P. Z. S. 1870, pp. 203, 204.

Caprimulgus fossi is figured, and *C. mossambicus* (Zool. Rec. v. p. 74) considered identical with it. O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 123, pl. i.

Caprimulgus inornatus (Zool. Rec. vi. p. 67) is figured. O. Finsch, Tr. Z. S. vii. p. 213, pl. 24.

CYPSELIDÆ.

Cypselus tectorum described as a new species. T. C. Jerdon, P. As. Soc. Beng. 1870, p. 61.—Identified with *C. infumatus* (Zool. Rec. ii. p. 100). A. O. Hume, tom. cit. p. 265; *Ibid.* Ibis, 1870, p. 533.

Cypselus tinus described as a new species. R. Swinhoe, tom. cit. p. 90.—Identified with *C. infumatus*. T. C. Jerdon, tom. cit. p. 533.

Cypselus pallidus is a new species from Egypt and Morocco. G. E. Shelley, tom. cit. p. 445.

Cypselus gutturalis is not distinct from *C. apus* (cf. Zool. Rec. iv. p. 90). G. Finsch, Tr. Z. S. vii. p. 215.

Chætura fumosa is a new species from Veragua, like *C. cinereiventris*, but sooty instead of grey underneath. O. Salvin, P. Z. S. 1870, p. 204.

Chætura brachycerca (Zool. Rec. iv. p. 90) is referred to *C. poliura*, Temm. P. L. Scclater, tom. cit. p. 329.

Chætura ussheri is a new species from Fantee, allied to *C. cassini*, Schl., but differently coloured above and on the throat. R. B. Sharpe, Ibis, 1870, p. 484.

TROCHILIDÆ.

Chætocercus bombus and *Thalurania hypochlora* are new species from Ecuador. J. Gould, P. Z. S. 1870, p. 804.

Eustephanus lcyboldi is a new species from Juan Fernandez. *Id.* Ann. N. H. (4) vi. p. 406. [Cf. Ibis, 1871, p. 181.]

Chrysolampis chlorolæma is a new species perhaps from New Granada. D. G. Elliot, tom. cit. p. 346.

Lophornis adorabilis, *Selasphorus torridus*, and *S. ardens* are new species from Veragua. O. Salvin, P. Z. S. 1870, pp. 207, 208.

PASSERES.

PITTIDÆ.

ELLIOT, D. G. Remarks on some lately described *Pittæ*, with a Synopsis of the Family as now known. *Ibis*, 1870, pp. 408-421, pls. xii., xiii.

The 8 species described since the completion of the author's 'Monograph,' in 1863, are first considered, and then follows a diagnostic list of the 32 species which he now recognizes as belonging to the subfamily. *Brachyurus megarhynchus*, *B. oreas*, and *B. bankanus* are figured; and woodcuts of *B. mackloti*, *B. strenuus*, Gould (which Mr. Elliot regards as a thick-billed form of the first), and *B. coccineus* and *B. granatinus* (considered to be identical) are given.

FORMICARIIDÆ.

Grallaria griseonucha is a new species from Venezuela resembling *G. brevicauda*, but stouter and differently coloured from every known species. P. L. Sclater & O. Salvin, P. Z. S. 1870, p. 786.

Clytostantes is a new genus of *Thamnophilinæ* most nearly allied to *Neotantes* (Zool. Rec. v. p. 76), of which it seems to be an exaggeration. The type is *Clytostantes alixi*, sp. n., from the Rio Napo. D. G. Elliot, *tom. cit.* pp. 243, 243, pl. xx.

DENDROCOLAPTIDÆ.

Synallaxis wyatti is a new species from New Granada, like *S. anthoides*, but having narrower dorsal stripes. P. L. Sclater & O. Salvin, P. Z. S. 1870, p. 841.

Synallaxis nigrifumosa (Zool. Rec. ii. p. 103) is *S. pudica*, Scl., and *Automolus rufescens* (*op. cit.* iii. p. 87) is *Philydor panerythrus*, Scl. O. Salvin, *Ibis*, 1870, p. 110.

Philydor consobrinus is a new species from Bogota, allied to *P. columbianus*, Cab., and *P. panerythrus*, Scl., but easily distinguished by its red cap. P. L. Sclater, P. Z. S. 1870, pp. 328, 329.

Anabazenops lineatus (Zool. Rec. ii. p. 103) is *A. subalaris*, Sclater. O. Salvin, *Ibis*, 1870, p. 110.

Coraphistera alaudina figured. P. L. Sclater, P. Z. S. 1870, p. 57, pl. iii.

Cinclodes albiventris, Scl., is not separable from *C. fuscus* (Vieill.). P. L. Sclater & O. Salvin, *tom. cit.* p. 786.

Sphenops ignobilis is referred to *Chlorospingus* (see *Tanagridæ*).

MELIPHAGIDÆ.

Heteralocha gouldi, its structure and habits. W. Buller, Tr. N. Z. Inst. iii. pp. 24-29, pl. 4.

Zosterops lateralis, its history in New Zealand (*cf.* Zool. Rec. iii. p. 88). *Id. tom. cit.* iii. pp. 15-23, pl. 3.

Zosterops subroseus is a new species from Hankow, resembling *Z. simplex*. R. Swinhoe, P. Z. S. 1870, p. 132.

Phyllornis lazulina is a new species from Hainan, closely allied to *P. hardwickii*. *Id. Ibis*, 1870, p. 255.

Ptilotis argentauris is a new species from the Moluccas, probably New Guinea or Waigiou. O. Finsch, Abh. Ver. Brem. 1870, p. 364.

Myzomela erythrocephala, *M. sanguinolenta*, *M. pectoralis*, *M. nigra*, and *M. obscura* figured. S. Diggles, Orn. Austr. pt. xxi.

Anthornis ruficeps (Zool. Rec. iv. p. 93) is a flower-stained specimen of *A. melanura*. W. Buller, Trans. N. Z. Inst. iii. p. 39.

NECTARINIIDÆ.

WALDEN, ARTHUR, Viscount. On the Sun-birds of the Indian and Australian Regions. Ibis, 1870, pp. 18-51, pl. i.

A carefully executed Monograph. Three natural genera, *Arachnechthra*, *Æthopyga*, and *Chalcostetha* are recognized; and *Nectarophila* and *Anthreptes* form two smaller groups, the affinities of which are not so evident. Forty species, one of which is new, are enumerated, and the complete synonymy and geographical distribution of each given. *Æthopyga christineæ* (Zool. Rec. vi. p. 72) and *Nectarophila grayi* are figured.

Nectarinia australis, Gould, is not distinguishable from *Arachnechthra frenata* (S. Müller) of the Moluccas. *Cosmetira minima* is a new species from Mysol, resembling *Cosmetira eques* (Less.), but much smaller and paler, with a less robust tarsus. Ld. Walden, *ut supra*.

Nectarinia fantensis was described as a new species. R. B. Sharpe, *tom. cit.* pp. 52, 474. It is *N. phæothorax*, G. Hartlaub, *tom. cit.* p. 443.

Æthopyga dabrii [Zool. Rec. vi. p. 94] is from Eastern Sechuen. P. L. Selater, *tom. cit.* p. 297.

Nectarinia jardini and *N. erythroceria* figured. O. Finsch & G. Hartlaub, Vög. Ost-Afr. Taf. ii.

Nectarinia acik [Zool. Rec. iv. p. 93] figured. T. Salvadori, Atti Acc. Tor. 1870, tav. i.

Nectarinia osiris is a name proposed for a Sun-bird referred to *N. jardini*, from North-eastern Africa, should it prove distinct. O. Finsch, Tr. Z. S. vii. p. 230.

Arachnechthra intermedia proposed as the name of the larger race of *A. curruccaria*, from Tipperah, Eastern Bengal. A. Hume, Ibis, 1870, p. 436.

Dicaeum minullum is a new species from Hainan, resembling *D. cruentatum*, but without the crimson rump. R. Swinhoe, *tom. cit.* p. 240.

COTINGIDÆ.

Chromachæris aurantiaca is a new species from Veragua, allied to *C. vitellina*, but smaller, and having dark orange underparts. O. Salvin, P. Z. S. 1870, p. 200.

AMPELIDÆ.

Hypocolius ampelinus (Zool. Rec. v. p. 80) should be referred to the *Coliidae*. E. de Selys-Longchamps, Ibis, 1870, p. 450.—Its habitat unknown. T. Salvadori, *tom. cit.* p. 539.

TIMALIIDÆ.

Garrulax rubiginosus (Zool. Rec. iv. p. 95) is a *Crateropus*. E. Blyth, *tom. cit.* p. 171.

Garrulax monachus is a new species from Hainan. R. Swinhoe, *tom. cit.* p. 248.

Myiothera, *Napothera*, and *Turdinus*. Several species of these genera in the Leyden Museum are variously identified. E. Blyth, *tom. cit.* pp. 167, 170.

Timalia larvata, S. Müll., is a *Stachyrhis*. *Id.* l. c.

Homochlamys lusciniæ is described as a new species from the Philippines and China. T. Salvadori, Att. Ac. Tor. 1870, p. 511.

Pomatorhinus nigrostellatus is a new species from Hainan, allied to *P. stridulus*, but larger, with black pectoral spots. R. Swinhoe, Ibis, 1870, p. 250.

Alcippe brucei is not distinguishable from *A. poiocephala*. A. Hume, J. A. S. B. 1870, p. 122.

Oxylobes is a new genus established for *Ellisia*? *madagascariensis*, Hartl. (Faun. Madag. p. 37). R. B. Sharpe, P. Z. S. 1870, pp. 386-8, figs.

Illadopsis gularis is a new species from Elmina, allied to *I. fulvescens*, but larger and more rufescent underneath. *Id.* Ibis, 1870, p. 474.

HIRUNDINIDÆ.

Stelgidopteryx fulvigula (Zool. Rec. ii. p. 106) is *S. uropygialis*, Lawr. O. Salvin, Ibis, 1870, p. 109.

SHARPE, R. B. On the *Hirundinidæ* of the Ethiopian Region. P. Z. S. 1870, pp. 286-321.

Thirty-eight species are enumerated, belonging to two subfamilies and to seven genera. *Atticora obscura*, Temm., is identified with *Psalidoprocne holomelana*, juv., and *Hirundo alfredi* (Zool. Rec. v. p. 81) with *Petrochelidon spilodera* (Sund. Cef. Sv. Ak. 1850, p. 108). A table of the geographical distribution is added, in which an attempt is made to divide the region naturally into five subregions—the Abyssinian, Mozambican, Cape, Guinean, and Madagascarian.

Hirundo rufula does not differ from *H. daurica*. E. de Selys-Longchamps, Ibis, 1870, p. 453.

Cotyle equeus (Zool. Rec. iii. p. 90) probably identical with *C. cincta* (Bodd.). R. B. Sharpe, P. Z. S. 1870, p. 579.

Atticora griseopyga is figured. T. v. Heugl. Orn. N. O. Afr. tab. vii.

Hirundo anchietæ (Zool. Rec. iv. p. 95) is *H. filifera*, Steph. J. V. B. du Bocage, Journ. Sc. Lisb. ii. p. 351 [cf. P. Z. S. 1870, p. 312].

Hirundo rustica. Some curious stages of plumage through which the species passes when wintering in South Africa pointed out. R. B. Sharpe & H. E. Dresser, P. Z. S. 1870, pp. 244-249.—Its various forms. O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 134.

Hirundo domicella is a new species from Senegal and North-eastern Africa. *Id.* tom. cit. p. 143.

Hirundo urbica at Rouen supposed to have improved its style of nest-building in the modern part of the town, and hence its power of reason inferred. A. Pouchet, C. R. 1870, i. pp. 492-496. The pleasing illusion dispelled by the fact that nests of *H. rustica*, in the new town, had been mistaken for those of *H. urbica*, which only builds in the old. M. J. B. Noulet, *ibid.* ii. pp. 77-81.

ORIOLIDÆ.

SHARPE, R. B. On the *Oriolidæ* of the Ethiopian Region. Ibis, 1870, pp. 213-229, pls. vii., viii.

A synopsis giving the full synonymy and diagnosis of each of the eight species. *Oriolus rolleti*, Salvadori, is regarded as a small race of *O. larvatus*, and *O. baruffii* identical with *O. brachyrhynchus*, both being figured, as well as *O.*

nigripennis and *O. notatus* (Zool. Rec. v. p. 81); and woodcuts of the heads of *O. crassirostris* and *O. larvatus* are given.

Oriolus anderssoni is a new species from Angola. J. V. B. de Bocage, Journ. Sc. Lisb. 1870, p. 342.

Psarolophus ardens, var. *nigellicauda* is described from Hainan. R. Swinhoe, Ibis, 1870, p. 343.

TYRANNIDÆ.

Ochthæca superciliosa and *O. nigrita* are new species from Venezuela, the former resembling *O. fumicolor*, but with ferruginous eyebrows and belly, the latter with the body ashy black. P. L. Sclater & O. Salvin, P. Z. S. 1870, pp. 786, 787.

Euscarthmus inpiger and *Sublegatus glaber* (Zool. Rec. v. p. 82) are figured. A. Ernst, Vargas. 1870, pls. i., ii.

Chipolegus cinereus is a new species from the Rio Paraná, belonging to the *Sericoptila* group, and distinguishable by being of a dark ash-colour nearly all over. P. L. Sclater, P. Z. S. 1870, p. 58.

Elainea gigas, *E. fallax*, and *E. pudica* are three newly described species: the first, from the Rio Napo, is the largest species of the genus; the second, from Jamaica (long since mentioned by name); and the third, from New Granada and Venezuela, is remarkable for its short and compressed bill. A synopsis of the sixteen known species is given. *Id. tom. cit.* pp. 831-835.

Elainea hundi, sp. n., from Brazil. J. Reinhardt, Vid. Medd. 1870, p. 154. pl. viii.

Myiopatris superciliaris, sp. n., from Brazil. P. W. Lund, *tom. cit.* p. 156, pl. viii.

Tenioterna variegata, *T. coronata*, *T. dominicana*, and *T. irupero*. Their habits described. W. H. Hudson, P. Z. S. 1870, pp. 333, 545-547.

Empidonax atriceps is a new species from Veragua, distinguishable by its black head. O. Salvin, *tom. cit.* p. 198.

Tyranniscus leucogonys, *T. improbus*, and *T. griseiceps* are new species from Columbia: the first resembling *T. cinereiceps*, but wanting the black auriculars and broad whitish wing-spots; the second is very like *T. vilissimus*, but with a yellower breast and blacker cap; the third has a flatter and broader bill, shorter wings, and a longer tail than others of the genus, of which a diagnostic list is given, there being now nine species known. P. L. Sclater & O. Salvin, *tom. cit.* pp. 841-843, pl. liii.

DICRURIDÆ.

Buchanga leucogenys, *B. mouhoti*, and *B. wallacii* are new species: the first ranging from Malacca through China to Japan; the second, from Cambodia, intermediate between *B. leucophæa* and *B. pyrrhops*; and the third from Lombok. Ld. Walden, Ann. N. H. (4) v. p. 220.

Buchanga innexa is a new species from Hainan, intermediate between *B. leucogenys* and *B. mouhoti* (*ut supra*). R. Swinhoe, Ibis, 1870, p. 247.

LANIIDÆ.

DRESSER, H. E., & SHARPE, R. B. Notes on *Lanius excubitor* and its allies. P. Z. S. 1870, pp. 590-600.

A synoptical table of nine closely allied species is given, and their geo-

graphical distribution shown. [*L. mollis*, Eversm., is accidentally omitted, cf. Ann. N. H. (4) xvii. p. 78.]

Lanius hemileucurus, Finsch & Hartl., *L. fallax* (Zool. Rec. vi. p. 77), and *L. dealbatus* are identified with *L. lahtora*.

Lanius fallax (ut supra) figured. O. Finsch, Tr. Z. S. vii. p. 249, pl. 25.

Lanius hemileucurus (cf. supra) described as a new species. O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 329.

Lanius waldeni is described and figured as a new species from Szechuen, but, in a footnote, identified with *L. magnirostris* (Zool. Rec. iv. p. 98). R. Swinhoe, P. Z. S. 1870, p. 131, pl. xi.

Telephonus longirostris, Sw., is Le Vaillant's "Tchagra," and therefore synonymous with *T. tschagra* (Vieill.). E. L. Layard, Ibis, 1870, p. 460.

Telephonus anchietæ is a new species from Angola. J. V. B. du Bocage, Jorn. Sc. Lisb. ii. p. 344.

Laniarius monteiri is a new species from Angola, allied to *L. icterus*, but with a broad white eyebrow. Both are figured. R. B. Sharpe, P. Z. S. 1870, p. 148, pl. xiii.

Laniarius sticturus and *L. salimæ* are new species: the first, from Zambesia, resembling *L. major* and *L. rufiventris*, but having the two outer rectrices tipped with white; the second, from Zanzibar, resembling *L. affinis*, but with the outer webs of the wing-coverts white. These, as well as *L. funebris* and *L. orientalis*, are figured, and a synopsis of the genus given. O. Finsch & G. Hartlaub, Orn. Ost-Afr. pp. 341-358, pls. iv. fig. 2, v. figs. 1-3.

Dryoscopus thamnophilus (Zool. Rec. vi. p. 77) is believed to be an American species belonging to the genus *Thamnophilus*, and not African at all. *Iid. tom. cit.* p. 358.

Nicator is a new name for a genus (= *Meristes*, Bp., 1854, nec Reichenb. 1850), the type of which is *Lanius chloris*, Valenc.; and *N. gularis*, from the Zambesi, is a new species like *Laniarius peli*, Bp., the buff chin, throat, and sides of the head excepted. *Iid. tom. cit.* pp. 359-361.

Rhopophilus is the name of a new genus, nearly allied to *Laniellus*, but not yet characterized! The type is *Drymæca* (?) *pekinensis* [Zool. Rec. v. p. 87]. H. H. Giglioli & T. Salvadori, Ibis, 1870, p. 187.

CAMPEPHAGIDÆ.

Ceblepyris major is a new species from Madagascar, allied to *C. cana*, but larger and the rectrices whiter. R. B. Sharpe, P. Z. S. 1870, p. 389.

Campephaga anderssoni was described as new, but is *C. pectoralis*, ♀. *Iid. tom. cit.* pp. 69, 70, pl. iv.; Ibis, 1870, pp. 432, 433.

Volocivora saturata is a new species from Hainan, smaller, darker, and shorter-winged than *V. lugubris*. R. Swinhoe, *tom. cit.* pp. 242-244.

Clytorhynchus is a new genus of *Pachycephalinæ*, holding to them the same relation that *Xenopirostris* does to *Laniidæ*. The type is

Clytorhynchus pachycephaloides, sp. n., from New Caledonia. D. G. Elliot, P. Z. S. 1870, p. 242, pl. xix.

MUSCICAPIDÆ.

Glaucomyias sordida is a new species from Ceylon. Ld. Walden, Ann. N. H. (4) v. p. 218.

1870. [VOL. VII.]

Niltava leucotis is described as a new species. A. Hume, Ibis, 1870, p. 144.
[An arte facta? Auct. in litt.—Ed.]

Cyornis simplex is a new species. E. Blyth, *tom. cit.* p. 165.

Cassinia finschi is a new species from Fantee, like *C. rubicunda*, Hartl., but fuscos above, and the outer rectrices edged with white. Both are figured. R. B. Sharpe, *tom. cit.* pp. 53, 54, pl. ii.

Elminia teresita (Zool. Rec. i. p. 78, and iv. p. 98) is called *E. longicauda minor*. T. v. Heuglin, Orn. N. O. Afr. pp. 448, 447.

Platystira orientalis is a new species, being the eastern form of *P. senegalensis*. *Id. op. cit.* pp. 449–451.

Pseudobias is a new genus from Madagascar, allied to *Terpsiphone* and *Bias*. The type is

P. wardi, sp. n. R. B. Sharpe, Ibis, 1870, p. 498, pl. xv.

Bias musicus (♂ & ♀) is figured. O. Finsch & G. Hartlaub, Vög. Ost-Afr. pl. iii. figs. 2, 3.

Muscicapa cinerea is a new species from Central East Africa. *Id. tom. cit.* p. 302, pl. iv. fig. 1.

Erythrostera leucura and *E. parva*. Their distribution. W. T. Blanford, Ibis, 1870, p. 533.

"*Erythrocerus livingstonii*, G. R. Gray," is a new species from Zambesia. O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 303.

MNIOTILTIDÆ.

SUNDEVALL, C. J. Æfversigt af fogelslägtet *Dendroica*. Æfv. Sv. Ak. 1869, pp. 605–618.

An excellent monograph, recognizing 30 species, of which none are new; but several subspecies are indicated.

Setophaga albifrons is a new species from Venezuela allied to *S. ruficoronata*, but with a white forehead and orbit. P. L. Sclater & O. Salvin, 1870, P. Z. S. p. 784.

Basileuterus melanotis (Zool. Rec. vi. p. 85) hardly differs from *B. bivittatus*. Perhaps also identical with *Myiadestes tristriatus*, Tsch. O. Salvin, Ibis, 1870, p. 108.

CINCLIDÆ.

Cinclus minor is a doubtful species from the Atlas, differing from *C. aquaticus* in size only. H. B. Tristram, Ibis, 1870, pp. 496, 497.

TURDIDÆ.

Turdus verreauxi is a new species from Angola. J. V. B. du Bocage, Journ. Sc. Lisb. ii. p. 342.

Turdus merula. A variety occurs near Pisa, the male never becoming quite black and the female with a redder breast. E. de Selys-Longchamps, Ibis, 1870, p. 452.

Turdus whittii in Somersetshire: C. Smith, Zool. s. s. p. 2018. In Ireland: H. Blake-Knox, *tom. cit.* p. 2060.

Geocichla layardi, from Ceylon. Ld. Walden, Ann. N. H. (4) v. p. 416.

"*Geocichla mutabilis*, S. Müller," from Java, is now described. E. Blyth, Ibis, 1870, p. 167.

Criniger pallidus is a new species from Hainan, resembling *C. flaveolus*, but not so yellow. R. Swinhoe, tom. cit. p. 252.

Criniger pallescens (Hartl.) is *Phyllastrephus scandens*, Swains. R. B. Sharpe, tom. cit. p. 473.

Crateropus senex is described as a new species from South Africa, but may be *C. hartlaubi* (Zool. Rec. v. p. 86). O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 290.

Garrulax rubiginosus (Zool. Rec. iv. p. 95) is *Crateropus atripennis*, Swains., from Africa. E. Blyth, Ibis, 1870, p. 171.

Andropadus flavescens (Zool. Rec. iv. p. 100) is figured. O. Finsch & G. Hartlaub, Vög. Ost-Afr. tab. iii. fig. 1.

Chetops grayi (Zool. Rec. vi. p. 79), and consequently *Drymæca anchietæ* (op. cit. v. p. 84), is identical with *Sphenæacus pycnopygius*, Scl. (Contr. Orn. 1852, p. 148, pl. 102). H. B. Tristram, Ibis, 1870, p. 497.

Brachypus urostictus is described as a new species from the Philippines. T. Salvadori, Atti Ac. Tor. 1870, p. 509.

Hypsipetes perniger, *Hemixus castanonotus*, and *Ixus hainanus* are new species from Hainan: the first resembling *H. nigerrimus*, but blacker; the second resembling *H. flava*, but differently coloured; the third is also from Naochow. R. Swinhoe, Ibis, 1870, pp. 251-255, pl. ix.

Pericocotus fraterculus is a new species from Hainan, resembling *P. speciosus*, but smaller. Id. tom. cit. 1870, p. 244.

Ixus andersoni is described as a new species from the river Yangtse. Id. Ann. N. H. (4) v. p. 175. It is *Pycnonotus xanthorrhous*, J. Anderson, J. A. S. B. 1870, p. 175.

Cittacincula macrura, var. *minor*, is the name proposed for the Hainan form, agreeing with that from Tenasserim, but much smaller than the Indian bird. R. Swinhoe, Ibis, 1870, p. 344.

Irena turcosa is the name proposed for the Javan species. Id. Ld. Walden, Ann. N. H. (4) v. p. 417.

Cossypha bocagii and *C. barbata* are new species, the former from Mossamedes, the latter from Benguela. O. Finsch & G. Hartlaub, Vög. Ost-Afr. pp. 284, 864.

SYLVIIDÆ.

Sialia wilsoni breeding in confinement. R. de Grady, Bull. Soc. Acclim. 1870, p. 209.

Bradyornis murinus is a new species from Benguela. O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 866.

"*Saxicola frenata*, Heugl." and *S. heuglini* (Zool. Rec. vi. p. 80) are described. Id. tom. cit. pp. 258, 259.

Saxicola capistrata (Zool. Rec. v. p. 86) is *S. picata*, and *S. montana* (tom. cit. p. 113) is *S. atrigularis* in breeding plumage. A. Hume, Ibis, 1870, p. 283.

Saxicola albomarginata and *S. brehmi* are new species: the first from the Tunisian Sahara, like *S. deserti*, but with a white-tipped tail; the second from Abyssinia. T. Salvadori, Att. Ac. Tor. 1870, pp. 507-509.

Saxicola finschi (Zool. Rec. vi. p. 80) is probably *S. libanotica*, H. & E. H. B. Tristram, Ibis, 1870, p. 495.

Pratincola robusta is a new species from Mysore and the Sutlej, allied to *P. pastor*, but larger and brighter, with a rufous belly. *Id. tom. cit.* p. 497.

Pratincola rubicola and *P. indica*, note on. E. Blyth, *tom. cit.* p. 167.

Calliope yeatmani is a new species from North-western India, smaller than *C. kamtschatkensis*, and differing in its proportions. H. B. Tristram, *tom. cit.* p. 444.

Accentor temmincki, Brandt, is *A. montanellus*, Temm. *Id. tom. cit.* p. 494.

Accentor erythropygius is a new species from North China, most resembling *A. nipalensis*. R. Swinhoe, P. Z. S. (24 Feb.) 1870, p. 124, pl. ix. [Qu. The species subsequently but independently described from Lake Baikal as *A. erythropygus*. J. Cabanis, J. f. O. 1870 (November *), pp. 457-459?]]

Ephthiamura albifrons breeding in Tasmania. J. Swan, P. R. Soc. Tasm. 1869, p. 7.

Ædon galactodes and *Acrocephalus turdoides* are figured. J. Gould, B. Gr. Br. pt. xvii.

Jerdonia is a new genus, closely allied to *Phyllopneuste*. The type is *J. agricolaensis*, sp. n., from N.W. India, resembling *Phyllopneuste rama*, but differing in structure and habits. A. Hume, Ibis, 1870, pp. 181-185.—The species referred to *Calamodyta*, and Mr. Hume's generic name disallowed, having been previously used. H. B. Tristram, *tom. cit.* pp. 494, 495.

Luscinola melanopogon near Agra in Central India. *Id. tom. cit.* p. 301; P. Z. S. 1870, p. 221.

Calamoherpe subflavescens is a new species from Dauria, resembling *C. fasciolata* and *C. fumigata*. D. G. Elliot, *tom. cit.* p. 245.

Sylvia locustella, notes on. C. Fickert, J. f. O. 1870, p. 439.

Bernieria crossleyi is a new species from Madagascar. A. Grandidier, R. Z. 1870, p. 50. It differs so much from others of the genus that it is made the type of a new one.

Mystacornis, which comes near *Tatare* and *Macrosphenus*, but has a more compressed bill and no rictal bristles. R. B. Sharpe, P. Z. S. 1870, pp. 392-394, pl. xxix.

Ficedula hypoleis in Ireland. H. Blake-Knox, Zool. s. s. p. 2018.

Hypoleis elaica in Italy. E. de Selys-Longchamps, Ibis, 1870, p. 452.

Drymæca swanzii and *D. brachyptera* are new species from the river Volta: the former allied to *D. lateralis*, but smaller, grey above, and with a rufous forehead; the latter remarkable for its very small size. R. B. Sharpe, *tom. cit.* p. 476.

Drymæca elegans, *D. lais*, and *D. rufilata* are new species; the first from the Cape, the second from Natal, and the last from Damara Land. O. Finsch and G. Hartlaub, Vög. Ost-Afr. pp. 237-238.

Drymæca (?) *pekinensis* (Zool. Rec. v. p. 87) is made the type of a proposed new genus, *Rhopophilus*, and referred to *Laniidae* (q. v.).

Eremomela canescens (Zool. Rec. vi. p. 84), *Drymæca troglodytes* (*tom. cit.* p. 83), and *D. antinorii* (*op. cit.* iv. p. 104) are figured. T. Salvad. Atti Acc. Tor. 1870, tav. 1, 2.

Eremomela griseoflava, Heugl., figured. W. Blanford, Geol. & Zool. Abyss. pl. iii. fig. 1.

* Received in England in May 1871.

Tricholais elegans and *Eremomela griseiflava* (Zool. Rec. vi. p. 84) are figured. T. v. Heuglin, Orn. N. O. Afr. tab. x., xi.

Cisticola cursitans and its various forms. O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 229-232.

Cisticola schenicola, its breeding in India (cf. Zool. Rec. v. p. 87). A. Hume, Ibis, 1870, pp. 137-139.

Prinia humilis is a new species from N.W. India, resembling *P. gracilis*, but uniformly coloured above. *Id. tom. cit.* p. 145.

Prinia albigularis was described as a new species. Ld. Walden, Ann. N. H. (4) v. p. 219. [Identified with *P. hodgsoni*. *Id. Ibis*, 1871, p. 112.]

Prinia, sp. ? , a second species supposed to inhabit Ceylon. W. V. Legge, P. Z. S. 1870, p. 673.

Dryodromas (Zool. Rec. vi. p. 84) is a new genus, intermediate between *Camaroptera* and *Dendroica*, the type being *Sylvia fulvicapilla*, Vieill.; and *Dryodromas albigularis* is a new species from Natal. O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 239.

Sylvia gracilioides, Temm., from "Andalusia," is probably the same as *Prinia gracilis*, Rüpp. E. Blyth, Ibis, 1870, p. 170.

Sylvia rueppelli, from Crete, is small, and perhaps forms a distinct race. E. de Selys-Longchamps, *tom. cit.* p. 450.

Phyllopnuste rufa, a small race said to occur in Lombardy. *Id. l. c.* p. 451.

Abornis fulvifacies is a new species from Szechuen. R. Swinhoe, *tom. cit.* p. 132.

"*Abornis atricapilla*, Temm.," from China, and "*Sylvia presbyter*, S. Müll.," from Timor, and "*S. virescens*, S. Müll.," from New Guinea, are described for the first time. E. Blyth, *tom. cit.* p. 169.

Phylloscopus neglectus is a new species, allied to *P. tristis*, but like *P. rama* above, though white under the wing. A. Hume, *tom. cit.* p. 143.

Phyllopnuste montana in Austria. V. v. Tschusi, J. f. O. 1870, pp. 264-268.

Reguloides superciliosus, its breeding. A. Hume, Ibis, 1870, p. 530.

MOTACILLIDÆ.

Hemcursus leucoschistus is a new species from Southern China, resembling *H. schistaceus*, but sufficiently distinct. R. Swinhoe, Ann. N. H. (4) vi. p. 154.

SWINHOE, R. On the Pied Wagtails of China. P. Z. S. 1870, pp. 120-124, 129, 130.

A synopsis, with descriptions and figures of the head, of the China species of *Motacilla*. These are 7 in number, 3 (*M. felix*, *M. francisi*, and *M. frontata*) being new, and a race of the first described as var. *sechuensis*; but some of the forms being very nearly allied, reference to these papers is indispensable for their determination.

Motacilla alba and *M. flava*, their various forms. O. Finsch & G. Hartlaub, Vög. Ost-Afr. pp. 259-274; E. de Selys-Longchamps, Ibis, 1870, p. 452.

Motacilla citreola, its synonyms. Ld. Walden, *tom. cit.* pp. 293, 294.

Corydalla griseirufescens is a new species from N.W. India, hitherto confounded with *Anthus sordidus*. A. O. Hume, *tom. cit.* p. 286.

Pipastes agilis and *P. maculatus* are *P. arboreus*. *Id. tom. cit.* 1870, p. 287.

Anthus crenatus is a new species from Damaraland. O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 275.

Anthus angolensis is a new species from Angola. J. V. B. du Bocage, Journ. Sc. Lisb. ii. p. 341. (Is *A. lineiventris*, Sundev.)

TROGLODYTIDÆ.

Rimator malacoptilus is figured. J. Gould, B. As. part xxii.

Thryothorus semibadius is a new species from Veragua, resembling *T. nigricapillus*, but wanting the black head. O. Salvin, P. Z. S. 1870, p. 181.

"*Thryothorus rufiventris*, Natt.," is the name given to a Brazilian species, referred by Herr von Pelzeln to *T. galbraithi*, which is only a local form of *T. leucotis*. P. L. Sclater, *tom. cit.* p. 323.

CÆREBIDÆ.

SUNDEVALL, C. J. Öfversigt af släktet *Certhiola*. Öfv. Sv. Ak. 1869, pp. 619-629.

This monograph enumerates 20 species, of which 4 are open to doubt.

Diglossa gloriosa is a new species from Venezuela, resembling *D. brunneiventris*, but smaller, and with a black throat and breast. P. L. Sclater & O. Salvin, P. Z. S. 1870, p. 784, pl. xlv. fig. 2.

SITTIDÆ.

Sitta neglecta is a new species from Burma, resembling *S. himalayensis*, but with a larger bill, ferruginous beneath, and wanting the white caudal spots. Ld. Walden, Ann. N. H. (4) v. p. 218.

PARIDÆ.

"*Parus pekinensis*, David," is a new species from Pekin, resembling *P. ater*, but with a longer crest. R. Swinhoe, Ibis, 1870, p. 155.

Parus venustus and *Ægithalus consobrinus* are new species from Western China: the first allied to *P. monticola*, but wanting the pectoral stripe; the latter with a larger bill than *Æ. pendulinus*, and a white eyebrow. *Id.* P. Z. S. 1870, pp. 133, 134.

Parus ater, peculiar nest of. H. Schacht, Zool. Gart. 1870, p. 129.

Parus caudatus in Holland. J. P. v. W. Crommelin, Ibis, 1870, pp. 442, 443.

Herpornis tyrannulus is a new species from Hainan, resembling *H. xantholeuca*, Nepal, but with a smaller bill and brighter yellow above. R. Swinhoe, *tom. cit.* p. 347, pl. ix.

Siva torqueola is a new species from the Tingchow Mountains, China. *Id.* Ann. N. H. (4) v. p. 174.

TANAGRIDÆ.

Sphenops ignobilis (Sclat. P. Z. S. 1861, p. 379) is referred to *Chlorospingus*, being *C. oleagineus* (ejusd. *op. cit.* 1862, p. 110), and *C. goeringi* is a new species from Venezuela, resembling *C. castaneicollis*, but stouter, and with a slate-coloured back and chestnut throat. P. L. Sclater & O. Salvin, P. Z. S. 1870, pp. 784, 785, pl. lxvi. fig. 1.

Buarremon merida is a new species from Venezuela, allied to *B. albifre-*

natus, but differing in its white throat and in having no black forehead. *Id. t. c. p. 785.*

Euphonia ochrascens is a new species from Brazil, resembling *E. vittata*, ScL., but with the yellow on the head extending to the eyes, and the abdomen golden inclining to ochre. A. von Pelzeln, Orn. Bras. p. 328.

Nemosia rousii is a new species from Rio de Janeiro. J. Cabanis, J. f. O. 1870, pp. 459, 460.

Tachyphonus rubrifrons (Zool. Rec. iv. p. 106) is *T. xanthopygius* ♀. O. Salvin, Ibis, 1870, pp. 109, 110.

Tachyphonus nitidissimus is a new species from Veragua, differing from *T. luctuosus* in its brighter colour and white lower wing-coverts, and from *T. delatris* in its orange crest. *Id. P. Z. S. 1870, p. 188.*

Tachyphonus nattereri is a new species from Brazil, resembling *T. cristatus*, but smaller, with the forehead and throat black, and other differences. A. v. Pelzeln, Orn. Bras. p. 328.

PLOCEIDÆ.

Sycobius nuchalis (Ibis, 1859, p. 393) is *Euplectes rufulatus*, Fras. R. B. Sharpe, Ibis, 1870, p. 472.

Euplectes madagascariensis, naturalized in St. Helena, associates and probably breeds with *Crithagra butyracea*. J. C. Melliss, *tom. cit.* p. 100.

Hyphantica hæmatocephala figured. T. v. Heugl. Orn. N. O. Afr. tab. xix. a.

Hyphantornis xanthopterus is a new species from Zambesia. O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 399.

Sycobrotus kersteni, sp. n., from Zanzibar. *Id. tom. cit.* p. 404, tab. vi.

Donacola atricapilla, *Munia chrysuræ*, and *M. muscadina* in the Leyden museum are *M. rubrinigra*, *M. leucogaster*, and *M. acuticauda*. E. Blyth, Ibis, 1870, p. 172.

FRINGILLIDÆ.

Oryzoborus? fringilloides is a new species from Brazil (♀ only described). A. von Pelzeln, Orn. Bras. p. 329.

Certhidea fusca, *Camarhynchus variegatus*, *C. habeli*, and *C. prothemelas*, and *Cactornis abingdoni* and *C. pallida* are new species from the Galapagos Islands. P. L. Sclater & O. Salvin, P. Z. S. 1870, pp. 324-327.

Pheucticus uropygialis is a new species from Columbia, like *P. aureoventris*, but with a yellow rump. *Id. tom. cit.* p. 840.

Spermophila superciliosa, *S. caboclinho*, *S. melanogaster*, *S. melanops*, *Haplospiza? crassirostris*, and *Sycalis citrina*, all being MS. names of Natterer's, are new species from Brazil. A. v. Pelzeln, Orn. Bras. pp. 330-333.

Pyrrhula bowronides, Less., is named *Spermophila lessoni*. O. Finsch, P. Z. S. 1870, p. 582.

Lobiospiza is a new genus, remarkable for wattles on the gape. The type is *L. notabilis*, a new species from the Navigators' Islands. G. Hartlaub & O. Finsch, *tom. cit.* p. 817, pl. xlix.

"*Crithagra capistrata*, Finsch," is a new species from Angola. *Id. Vög. Ost-Afr. p. 458.*

Padda oryzivora in confinement. O. Stölker, J. f. O. 1870, pp. 81-84.

Passer assimilis is a new species from Burmah, with a smaller bill than

P. cinnamomeus, white cheeks, and ashy grey beneath. Ld. Walden, Ann. N. H. (4) v. p. 218.

Passer canicapillus (Zool. Rec. iv. p. 108), *Pyr gita jugifera*, and *Linota fringillirostris*, Bp., are *P. dentatus*, Sundev., *P. flaveolus*, and *L. cannabina*. E. Blyth, Ibis, 1870, p. 172.

Fringilla canaria in England. F. Bond, Zool. s. s. p. 2022.

Serinus hortulanus in England. *Id. tom. cit.* p. 1984. Figured: J. Gould, B. Gr. Br. pt. xviii.

Chlorospiza plumbea (Zool. Rec. ii. p. 118) and *Phrygilus geospizopsis*, Sclat., are *P. unicolor* (Laf. & D'Orb.), and *Chrysomitris bryanti* (Zool. Rec. ii. p. 119) is *C. xanthogastra*, Du Bus. P. L. Sclater & O. Salvin, P. Z. S. 1870, p. 785.

Pytelia hypogrammica and *P. schlegeli* are new species from Fantee; the last figured. R. B. Sharpe, Ibis, 1870, pp. 56, 482, pl. xiv. figs. 2, 3.

Carpodacus erythrinus in England. F. Bond, Zool. s. s. pp. 1984, 2383.

Loxia curvirostra, its parasite. P. Marchi, Atti Soc. Ital. xii. p. 534.

EMBERIZIDÆ.

Emberiza hortulana, formerly almost unknown in Bohemia, is now common there. A. Fritsch, J. f. O. 1870, pp. 31, 32.

Emberiza striolata, its full history. A. Hume, Ibis, 1870, pp. 399-407.

Emberiza intermedia replaces *E. palustris* or *E. schœniclus* in Piedmont. E. de Selys-Longchamps, *tom. cit.* p. 450.

Emberiza elegantula is a new species from Western China (♀ only described). R. Swinhoe, P. Z. S. 1870, p. 135.

Euspiza melanocephala, *E. luteola*, and *Emberiza cinerea* figured. J. Gould, B. As. pt. xxii.

Emberiza pusilla figured. *Id.* B. Gr. Br. pt. xvii.

ALAUDIDÆ.

Alauda sibirica in England. G. D. Rowley, P. Z. S. 1870, p. 52, Zool. s. s. p. 2066; F. Bond, *tom. cit.* p. 2022.

Alauda sala is a new species from Hainan and Formosa. R. Swinhoe, Ibis, 1870, p. 355.

Alauda piscoletta in N.W. India. A. Hume, *tom. cit.* p. 531.

Alauda simillima is a new species from Northern India, allied to *A. deva*, but paler in colour and with a longer crest. *Id.* J. A. S. B. 1870, p. 121.

Coraphites melanauchen figured. O. Finsch, Tr. Z. S. vii. pl. 26.

Alceon jessii was described as a new species from Abyssinia. *Id. tom. cit.* p. 273. Is *A. desertorum*: *Id.* & G. Hartlaub, Vög. Ost-Afr. pp. 869, 870.

Geocoraphus modestus is figured. T. v. Heuglin, Orn. N. O.-Afr. tab. xxiii.

Megalophonus anderssoni (Zool. Rec. vi. p. 89) is possibly *M. ruficinnamomeus* (*op. cit.* iii. p. 100). T. Salvadori, Ibis, 1870, p. 154.

Otocorys. Notes on species of the genus. O. Finsch, Abh. Ver. Brem. 1870, pp. 341-352.

Otocorys alpestris (*ad.* & *pull.*) figured. J. Gould, B. Gr. Br. pt. xviii.

ICTERIDÆ.

Molobrus sericeus and *M. badius*. Eggs figured. L. Holtz, J. f. O. 1870, Taf. i. figs. 1, 2.

Molothrus bonariensis. Its habits. W. H. Hudson, P. Z. S. 1870, pp. 548-550, 671-673.

"*Leistes erythrothorax* (Natterer)" is a new species from Brazil. A. von Pelzeln, Orn. Bras. p. 326.

Quiscalus major. A full and excellent account of its habits. E. Coues, Ibis, 1870, pp. 367-378.

Sturnella militaris. Nest and eggs. A. Newton, *tom. cit.* p. 501.

STURNIDÆ.

Sturnus purpurascens figured. J. Gould, B. As. pt. xxii.

Sturnus vulgaris. One remarkable for its accomplishments in 1582. R. König-Warthaussen, J. f. O. 1870, pp. 65, 66.

Acridotheres leucocephalus is a new species from Cochin-China. H. H. Giglioli & T. Salvadori, Ibis, 1870, p. 186.

Eulabes hainanus and *E. sinensis* are new species, the first from Hainan, closely resembling the second, but with different subocular caruncles; the second from China, like *E. intermedius*, but smaller, with a very narrow nuchal caruncle. R. Swinhoe, *tom. cit.* pp. 352-354.

Podoces panderi. Specimen exhibited. R. B. Sharpe, P. Z. S. 1870, p. 334.

Gracula kreffti. Its habits. J. Brazier, *tom. cit.* 1870, p. 551.

Gracula. A popular account of the genus. F. Schlegel, Zool. Gart. 1870, pp. 9-12.

Lamprocolius acuticaudus is a new species from Angola. J. V. B. du Bocage, Journ. Sc. Lisb. ii. p. 345.

Lamprocolius chloropterus breeding in confinement. R. de Grady, Bull. Soc. Acclim. 1870, p. 210.

CORVIDÆ.

Corvus macrorhynchus, Temm., is *Corvus culminatus*, Sykes, and *Corvus validus*, Schl., is *C. tenuirostris*, Moore. E. Blyth, Ibis, 1870, p. 171.

Corvus sinensis and *C. corone* from Naochow. Their heads figured. R. Swinhoe, *tom. cit.* p. 349.

Corvus corone and *C. cornix* figured. J. Gould, B. Gr. Br. pts. xvii., xviii.

Garrulus cervicalis said to occur in Spain. E. de Selys-Longchamps, Ibis, 1870, p. 451.

Cyanocorax pileatus. Its habits. W. H. Hudson, P. Z. S. 1870, pp. 748-750.

Cyanocitta elegans is a new species from Mexico, like *C. colliei*, but with white tips to the crest and some other differences. O. Finsch, Abh. Ver. Brem. 1870, p. 335.

COLUMBÆ.

COLUMBIDÆ.

Columba turricola not a good species. E. de Selys-Longchamps, Ibis, 1870, p. 454.

Columba livia and *Turtur auritus* figured. J. Gould, B. Gr. Br. pt. xviii.

Turtur sharpii, sp. n., Egypt, resembles *T. auritus*, but has no blue tinge on the head and other differences. G. E. Shelley, Ibis, 1870, pp. 447, 448.

Turtur decipiens and *T. damarensis*, spp. nn.: the former from East Africa, hitherto confounded with *T. risorius* and other allied species; the latter from Damara Land, allied to *T. capicola*, Sundev. O. Finsch & G. Hartlaub, Vög. Ost-Afr. pp. 544, 545, 550.

"*Peristera cyanopsis*, Natterer," *Leptoptila reichenbachii*, and "*L. ochroptera* (Natterer)," spp. nn., from Brazil. A. von Pelzel, Orn. Bras. pp. 336, 337, and 278.

Leptoptila chlorauchenia, sp. n., from Uruguay, allied to *L. rufazilla*. H. H. Giglioli & T. Salvadori, Ibis, 1870, p. 187. [*Qu.* = *L. ochroptera* (ut suprâ)?]

Streptopelia barbarus (Zool. Rec. i. p. 87) is *S. albiventris*. O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 546. A good species, T. Salvadori, Atti Acc. Tor. 1870, p. 745.

Geopelia tranquilla and *G. cuneata* figured. S. Diggles, Orn. Austr. pt. xxi.

Osmotreron domvili is a new species from Hainan, resembling *O. bicincta*, but smaller, with a green throat and forehead and other distinctions. R. Swinhoe, Ibis, 1870, pp. 354, 355.

Macropygia tusaha, var. *minor*, is the Hainan form of *Macropygia*. *Id. tom. cit.* pp. 355, 356.

DIDUNCULIDÆ (?).

Otidiphaps is a remarkable new genus, in general coloration calling *Didunculus* to mind, but with a more normally columbiform bill and longer legs. The type is

O. nobilis, sp. n., New Guinea? J. Gould, Ann. N. H. (4) v. p. 62, P. Z. S. 1870, p. 4. Drawing of a specimen, received from Dr. Salvadori, exhibited. P. L. Selater, *tom. cit.* p. 157.

GALLINÆ.

CRACIDÆ.

SCLATER, P. L., & SALVIN, O. Synopsis of the *Cracidae*. P. Z. S. 1870, pp. 504-544.

A very complete monograph of the family. After some introductory remarks and a history of the group, showing how the knowledge of it has gradually extended, there follows a diagnostic synopsis of the 52 species (one of which is new) arranged in three subfamilies—*Cracinae* (with four genera), *Penelopinae* (with seven genera, one of which is new), and *Oreophasinae* (with one genus), some remarkable identifications of species hitherto regarded as distinct being made. An account of the geographical distribution of the family, compendiously shown in a table, ends this excellent paper.

Stegnolema is the new genus just mentioned, resembling *Penelope*, but with a bare space on the lower part of the throat only. The type is *Ortalida montagnii*, Bp. *Id. ut suprâ*, p. 521.

Ortalida ruficrissa, sp. n., from New Granada, resembling *O. vetula*, but with a rufous vent and broad white tips to the rectrices. *Id. ut suprâ*, p. 538.

Penelope ochrogaster is a new species from Brazil resembling *P. pileata*, but with a rufous head and scarcely chestnut hind neck. A. von Pelzel, Orn. Bras. p. 337 [*cf.* P. Z. S. 1870, p. 527].

"*Crax pinima*, Natter," and *C. mikani* are new species from Brazil. *Id. tom. cit.* pp. 342, 343. The male of the latter is probably the female of *Crax daubentoni*; and the female is probably not distinct from *C. alberti*. P. L. Sclater & O. Salvin, P. Z. S. 1870, p. 516.

PHASIANIDÆ.

ELLIOT, D. G. A Monograph of the *Phasianide* or Family of Pheasants. 1870, part I., imp. folio.

The most gorgeous ornithological work yet published. The plates are from designs by Mr. Wolf; and their large size gives ample scope to display his excellences. The letterpress contains sufficient particulars, if not a full account of each species. Those figured are:—*Pavo nigripennis*, *Phasianus scemmerringi*, *Polyplectron germaini* (Zool. Rec. iii. p. 107), *Crossoptilon thibetianum*, *Argus grayi* (op. cit. ii. p. 125), *Euplocamus nycthemerus*, *Pucrasia macrolopha*, *Thaumalea amherstiae*, *Gallus ferrugineus*, *Euplocamus albocristatus*, *Lophophorus lhuysi* (op. cit. iii. p. 107), *Euplocamus praelatus*, *Cerionis blythi* (v. infra), *Numida mitrata*, and *N. verreauxi* (v. infra).

Phasianus decollatus is a new species from Szechuen, resembling *P. torquatus*, but wanting the collar. R. Swinhoe, P. Z. S. 1870, pp. 135, 136.

Phasianus shawi, *P. insignis*, and *P. formosanus* are described as new species: the first two from Yarkand, of which the second resembles *P. mongolicus*, the other *P. colchicus*, and is regarded as the form from which all others have sprung; the third is the Formosan bird hitherto referred to *P. torquatus*. Another species, "*P. sladeni*, Anderson, MS.," is mentioned as resembling *P. versicolor*, but is not described. D. G. Elliot, *tom. cit.* pp. 402–408.

Phasianus elegans is another new species from Szechuen. *Id. Ann. N. H.* (4) vi. pp. 312–314; P. L. Sclater, P. Z. S. 1870, p. 670.

Thaumalea amherstiae, its habitat. R. Swinhoe, P. Z. S. 1870, p. 111; P. L. Sclater, *tom. cit.* p. 670. In confinement: L. D. Carreau, Bull. Soc. Acclim. pp. 502–507.

Euplocamus swinhoi in confinement. A. Touchard, *tom. cit.* 1870, pp. 417–423.

Cerionis blythii is a new species from Upper Assam. T. C. Jerdon, Pr. As. Soc. Beng. 1870, p. 60; P. L. Sclater, P. Z. S. 1870, p. 163, pl. 15. [*Cf. Ibis*, 1870, pp. 147, 520.]

Lophophorus sclateri is a new species from Upper Assam. T. C. Jerdon, *Ibis*, 1870, pp. 147, 148 [*cf. etiam* p. 520], Pr. As. Soc. Beng. 1870, p. 60; P. L. Sclater, P. Z. S. 1870, pp. 162, 163, pl. xiv.

Crossoptilon caeruleum is a new species from Szechuen. A. David, C. R. 1870, p. 538.

Crossoptilon auritum and *Polyplectron bicalcaratum* figured. J. Gould, B. As. pt. xxii.

Numida cornuta is a new species from South Africa, confounded hitherto with *N. mitrata*. O. Finsch & G. Hartlaub, Vög. Ost-Afr. pp. 569, 570.

Numida verreauxi is described as new, being nearly allied to *N. cristata*. D. G. Elliot, *Ibis*, 1870, p. 300; Monogr. Phas. pt. i. Referred to *N. eduardi* (Zool. Rec. vi. p. 92). G. Hartlaub, *Ibis*, 1870, p. 444.

TETRAONIDÆ.

Francolinus hartlaubi is a new species from Angola. J. V. B. du Bocage, Journ. Sc. Lisb. ii. p. 350.

Francolinus cranchi and *F. kirki* figured. O. Finsch & G. Hartlaub, Vög. Ost-Afr. tabb. ix., x.

Francolinus? A new species from Cutch indicated, but not described. A. Hume, J. A. S. B. 1870, p. 121.

Tetrao urogallus. Variations in the windpipe. L. Martin, Zool. Gart. 1870, p. 24.

Tetrao tetrix near Ekaterinbourg. L. Favre, Bull. Soc. Neuch. viii. p. 428.

Caccabis chukar in St. Helena differs somewhat from the type, possibly through its naturalization in that island. J. C. Melliss, Ibis, 1868, p. 103.

Caccabis —? On the species which existed in a semidomesticated state in Rhodes between 1585 and 1589. R. König-Warthaussen, J. f. O. 1870, p. 66.

MEGAPODIIDÆ.

Megapodius huttoni is a new species from Nuipo, in the Friendly Islands. W. Buller, Tr. N. Z. Inst. iii. p. 14.

OPISTHOCOMIDÆ.

Opisthocomus cristatus. Two eggs figured (Zool. Rec. iv. p. 117). L. Holtz, J. f. O. 1870, taf. 1.

GRALLÆ.

RALLIDÆ.

Telmatornis priscus and *T. affinis* are new fossil species from the cretaceous formations of New Jersey. O. C. Marsh, Am. J. Sc. 1870, pp. 210, 211.

Porzana mandarina is a new species from Canton. R. Swinhoe, Ann. N. H. (4) v. p. 173.

Corethrura insularis is a new species from Madagascar. R. B. Sharpe, P. Z. S. 1870, p. 400.

Porphyrio alleni at Lucca and *P. chloronotus* supposed to have occurred in Sicily. E. de Selys-Longchamps, Ibis, 1870, pp. 452-454.

SCOLOPACIDÆ.

Palæotringa littoralis and *P. vetus* are new fossil species from the cretaceous greensand of the middle and lowest marl-beds of New Jersey. O. C. Marsh, Am. J. Sc. 1870 p. 208, 209.

Numenius hudsonicus in Ireland. H. Blake-Knox, Zool. s.s. p. 2409.

Tringa bonapartii in England. E. H. Rodd and C. Smith, tom. cit. pp. 2274, 2409.

Tringa wilsoni in England. M. S. C. Rickards, tom. cit. p. 2025.

Tringa bairdi in Africa. J. E. Harting, Ibis, 1870, p. 152.

Limnocinclus pectoralis, *Tryngites rufescens*, and *Limicola pygmæa* figured. J. Gould, B. Gr. Br. pt. xviii.

Actodromas minuta and *Leimonites temmincki* figured. Id., op. cit. pt. xvii.

Terekia cinerea near Pisa. T. Salvadori, Ibis, 1870, p. 154.

Totanus chloropygius in Scotland. R. Gray, *tom. cit.* p. 292.

CHARADRIIDÆ.

Himantopus candidus. Its breeding-habits in India. A. Hume, Ibis, 1870 p. 145. Figured, as also *Hæmatopus ostralegus* and *Glareola pratincola* (ad. & pull.), J. Gould, B. Gr. Br. pt. xviii.

Anarhynchus frontalis. Its habits: T. H. Potts, Tr. N. Z. Inst. ii. pp. 68, 69. Its young: F. W. Hutton, Ibis, 1870, p. 394 [Zool. Rec. vi. p. 96]. Chick exhibited and bill figured: A. Newton, P. Z. S. 1870, pp. 673, 674.

HARTING, J. E. On rare or little-known *Limicolæ*. Ibis, 1870, pp. 201-213, 378-392, pls. v., vi., xi.

In continuation of former papers (Zool. Rec. vi. pp. 95, 96). The species now treated are *Eudromias asiaticus* and *E. veredus*, *Ægialitis geoffroyi* and *Æ. mongolicus*. The first three are figured in breeding plumage.

SWINHOE, R. On the Plovers of the genus *Ægialitis* found in China. P. Z. S. 1870, pp. 136-142, pl. xii.

Treats of 8 species, 2 being new: *Æ. hartingi*, from Western China, which is figured, and *Æ. dealbatus*, which resembles *Æ. cantianus*, but is resident in Southern China, Formosa, and Hainan.

Limnetes is proposed as a new name for the genus *Defilippia* (Zool. Rec. 1866, p. 110). O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 640.

OTIDIDÆ.

Otis tarda. History of its extermination in Norfolk. H. Stevenson, B. Norf. ii. pp. 1-42.

GRUIDÆ.

Grus haydeni is a new fossil species from the tertiary beds of the Niobrara River. O. C. Marsh, Am. J. Sc. 1870, p. 214.

Grus cinerea in Norfolk. H. Stevenson, Tr. Norw. Soc. 1870, p. 60.

ARDEIDÆ.

Pyrhrherodia is a new subgenus proposed for *Ardea purpurea*; but no characters are given. O. Finsch & G. Hartlaub, Vög. Ost-Afr. p. 676.

Ardea grayi is distinct from *A. leucoptera*, but *A. idæ* is referred to the latter. J. H. Gurney, Ibis, 1870, pp. 150, 151.

Ardea similis from the Miocene at Steinheim. O. Fraas, Württ. JH. p. 254, tab. vii.

Herodias garzetta and *Nycticorax griseus* figured. J. Gould, B. Gr. Br. pts. xviii., xvii.

Nycticorax pauper is a new species from the Galapagos Islands, resembling *N. violaceus*, but smaller, darker, and with uniform greyish-black occipital plumes. P. L. Sclater & O. Salvin, P. Z. S. 1870, p. 327.

Calherodius cucullatus in South Africa. E. L. Layard, Ibis, 1870, p. 443.

Botaurus lentiginosus in Ireland. H. Blake-Knox, Zool. s. s. p. 2408.

CICONIIDÆ.

Mycteria australis, its breeding. C. Horne, Ibis, 1870, p. 295.

TANTALIDÆ.

Ibis pagana from the Miocene formation at Steinheim. O. Fraas, Württ. JH. 1870, p. 284.

Ibis falcinellus, its habits in Brazil. W. H. Hudson, P. Z. S. 1870, p. 799.

Theristicus melanopsis, egg described. A. Newton, Ibis, 1870, p. 502. [Figured P. Z. S. 1871, pl. iv. fig. 8.]

CARIAMIDÆ.

Chunga burmeisteri in captivity. P. L. Sclater, P. Z. S. 1870, p. 666, pl. xxxvi.

ANSERES.

COUES, ELLIOTT. On the Classification of Water Birds. P. Ac. Philad. 1869, pp. 193-218.

The object of this paper is more restricted than would appear from its title, and is to prove that the *Natatores* form one of three primary divisions, or "subclasses" of birds, or at least of Carinate birds. After reviewing the various classifications of the group which have been proposed by different systematists, the author comes to a conclusion very similar to that of Prof. Lilljeborg (Zool. Rec. iii. p. 46), and separates the "subclass" into four "orders":—(1) *Pygopodes* including the *Spheniscidæ*, *Alcidæ*, *Colymbidæ* and *Podicipidæ*; (2) *Longipennes* comprising *Procellariidæ* and *Laridæ*; (3) *Steganopodes* divided into six "families," *Sulidæ*, *Pelecanidæ*, *Phalacrocoracidæ*, *Plotidæ*, *Tachypetidæ* and *Phaetontidæ*; and (4) *Lamellirostrres* consisting of *Anatidæ*. The *Phenicopteridæ* are referred to the "subclass" *Cursores*, and the *Heliornithidæ* regarded as allied to *Fulica*. The whole paper furnishes additional proof of the author's ability, already well displayed in his previous treatises, some of which have been before noticed in this annual (Zool. Rec. i. p. 95, iii. p. 113, v. p. 111), and contains many facts not previously brought together; but it may be questioned whether his views will meet with very general acceptance. (Cf. Am. Nat. iv. pp. 746-752.)

PHENICOPTERIDÆ.

Phenicopterus antiquorum breeding in France. J. W. Clark, Ibis, 1870, p. 439.

Palcelodus steinheimensis is a new species resembling *P. goliath* and *P. crassipes* (Zool. Rec. v. p. 108), from the Miocene at Steinheim, as also *P. gracilipes* (l. c.). O. Fraas, Württ. JH. 1870, pp. 285, 286, taf. vii., viii.

ANATIDÆ.

Laornis edwardsianus from the greensand of the upper cretaceous marl-bed in New Jersey. O. C. Marsh, Am. J. Sc. 1870, p. 207.

BANNISTER, B. H. A sketch of the Classification of the American *Anserinæ*. P. Ac. Philad. 1870, pp. 130, 132.

Of the 7 genera to which the 18 species are referred, three are new: *Oresochen* (type *Anser melanopterus*, Gay), *Chloetrophus* (type *Bernicla poliocephala*, Gray), and *Philacte* (type *A. canagica*, Sewastianoff).

Bernicla dispar (Ph. & Landb.) is probably *Chloephaga magellanica*. P. L. Sclater & O. Salvin, Ibis, 1870, p. 500. Egg of the latter described. A. Newton, *tom. cit.* p. 504.

Bernicla ruficollis, probably in India. E. Blyth, *tom. cit.* p. 176. Figured, as also *B. brenta*. J. Gould, B. Gr. Br. pt. xviii.

Cygnus nigricollis, egg described. A. Newton, Ibis, 1870, p. 504.

Anas atava and *A. cygniformis*, with *A. blanchardi* (Zool. Rec. iv. p. 122), from the miocene at Steinheim, the former resembling or identical with *A. ceningensis*, Meyer. O. Fraas, Württ. JH. 1870, pp. 275-279, Taf. xiii.

Metopiana peposaca and *Dafila spinicauda* figured. P. L. Sclater, P. Z. S. 1870, p. 666, pls. xxxvii., xxxviii.

Dendrocygna eytoni and *D. arcuata* figured. S. Diggles, Orn. Austr. pt. xxi.

Micropterus cinereus. Eggs described. A. Newton, Ibis, 1870, p. 504.

Somateria mollissima, *S. spectabilis*, and *Harelda glacialis* figured. J. Gould, B. Gr. Br. pt. xvii.

Branta rufina breeding in Germany. E. Baldamus, J. f. O. 1870, pp. 278-281.

LARIIDÆ.

Larus hemprichi figured. O. Finsch, Tr. Z. S. vii. pl. xxvii.

Larus dominicanus. Egg described. A. Newton, Ibis, 1870, p. 503.

Larus gelastes in Sicily. T. Salvadori, *tom. cit.* p. 153; H. Saunders, *tom. cit.* p. 298.

Larus cirrhocephalus. Its habits. W. H. Hudson, P. Z. S. 1870, p. 802.

Rissa tridactyla. Its change of plumage. H. Blake-Knox, Zool. s. s. pp. 2119-2124.

Pagophila eburnea figured. J. Gould, B. Gr. Br. pt. xvii.

Catarrhactes antiquus from the tertiary deposits of North Carolina. O. C. Marsh, Am. J. Sc. 1870, p. 213.

Hydrochelidon leucoptera in India. A. Hume, Ibis, 1870, p. 435.

Hydrochelidon albigena figured. O. Finsch & G. Hartlaub, Vög. Ost-Afr. tab. x. fig. 2.

PROCELLARIIDÆ.

Puffinus conradi from the Miocene of Maryland. O. C. Marsh, Am. J. Sc. 1870, p. 212.

Puffinus major and *Procellaria glacialis* figured. J. Gould, B. Gr. Br. pts. xvii., xviii.

Nectris amaurosoma (Zool. Rec. i. p. 96) off Coquimbo. P. L. Sclater & O. Salvin, Ibis, 1870, p. 500.

Daytion capensis occurs in Palk Strait. A. Hume, *tom. cit.* p. 498.

Œstreleta gouldi (Zool. Rec. vi. p. 101) described. F. W. Hutton, Tr. N. Z. Inst. ii. p. 70.

PELECANIDÆ.

Pelecanus intermedius from the Miocene formation at Steinheim. O. Fraas, Württ. JH. 1870, p. 281, Taf. xiii.

Pelecanus sharpii is a new species from Angola. J. V. B. du Bocage, P. Z. S. 1870, pp. 173, 409.

Pelecanus fuscus. Its habits. L. Martin, Zool. Gart. 1870, p. 37.

Phalacrocorax carbo breeding in confinement. M. Schmidt, *tom. cit.* p. 12.

Graculus idahensis from Tertiary deposits in Idaho. O. C. Marsh, Am. J. Sc. 1870, p. 217.

SPHENISCIDÆ.

Dasyrhamphus herculis is a new species, resembling *D. adelæ*, but with the sides of the head and throat white. O. Finsch, P. Z. S. 1870, p. 322, pl. xxv.

PODICIPIDÆ.

Podiceps widalmi is described as a new species from Southern Russia. H. Goebel, J. f. O. 1870, pp. 312-315. [*An Podiceps cristatus* ♀ *vel juv.* ?]

Podiceps hectori (Zool. Rec. vi. p. 102). Further evidence as to its distinctness. W. Buller, Ibis, 1870, p. 400; Tr. N. Z. Inst. ii. p. 392.

Podiceps auritus figured. J. Gould, B. Gr. Br. pt. xvii.

ALCIDÆ.

Alca impennis. Its existing remains (71 or 72 skins, 9 skeletons, and 65 eggs). A. Newton, Ibis, 1870, pp. 256-261; V. Fatio, Bull. Soc. Orn. Suisse, ii. pp. 80-85. Specimens in Italian museums. E. de Selys-Longchamps, Ibis, 1870, p. 449.

STRUTHIONES.

STRUTHIONIDÆ.

Struthio camelus. Excellent history of the species, O. Finsch & G. Hartlaub, Vög. Ost-Afr. pp. 597-607. Breeding at Florence: M. Desmeure, Bull. Soc. Accl. 1870, p. 205. In Algeria: C. Rivière, *tom. cit.* pp. 566-577.

CASUARIIDÆ.

Dromæus novæ-hollandiæ breeding in confinement. F. Le Prestre, Bull. Soc. Acclim. 1870, pp. 104-121.

DINORNITHIDÆ.

Dinornis crassus. Bones from Oameru, New Zealand. L. Coulon, Bull. Soc. Neuch. viii. p. 476.

ÆPYORNITHIDÆ.

Æpyornis. Reaffirmation (Zool. Rec. v. p. 113) of its Vulturine affinities. J. J. Bianconi, C. R. 1870, p. 162.

APTERYGIDÆ.

Apteryx. Details of its structure figured. W. Buller, Tr. N. Z. Inst. pl. xii. b.

REPTILIA

BY

ALBERT GÜNTHER, M.A., M.D., PH.D., F.R.S.

GENERAL NOTES AND FAUNÆ.

IN reply to Prof. Huxley's paper on the homologies of the auditory ossicles (see Zool. Record, vi. p. 108), Prof. PETERS has re-examined the auditory ossicles and the pneumatic duct of the mandible in Crocodiles. The latter forms a direct communication between the articular and tympanic cavity. MB. Ak. Berl. 1870, pp. 15-22, pls. 1, 2.

Sardinia. A. CARUCCIO gives a list of 17 Reptiles and 5 Batrachians inhabiting this island. Att. Soc. Ital. Sc. nat. xii. 1870, pp. 565-567.

Abyssinia. Mr. BLANFORD's work, 'Observations on the Zoology and Geology of Abyssinia,' has been noticed above (p. 3). In the part "*Reptilia*" (pp. 444-459) two Tortoises, 13 Lizards, 7 Snakes, and 5 Frogs are referred to. Several of the Lizards are described as new.

Senegambia. Dr. STEINDACHNER gives an account of the Reptiles collected by him in this country. SB. Ak. Wien, 1870, lxii. pp. 326-335. Twenty-seven species.

South Africa. PETERS reports on a collection made at Hantam (Oorlogsveld, S.W. Africa). MB. Ak. Berlin, 1870, pp. 110-115. Sixteen Lizards, eight Snakes, and two Frogs.

Round Island. Sir H. BARKLY, whilst Governor of the Mauritius, took steps for the thorough examination of this remarkable islet. He has given a report in a pamphlet, 'Notes on the Flora and Fauna of Round Island,' taken from the 'Mauritius Almanac and Register' for 1870. Mauritius, 1870, 8vo, pp. 15. It contains a description of the physical features of the island, and of the collections made by the exploring parties. [The Reptiles were sent to the Recorder for examination, and proved to consist of fine series of *Thyrus boyerii* (Desj.), *Leiolepisma bellii* 1870. [VOL. VII.]

(Gray, = *Scincus telfairii*, Desj.), and that remarkable Snake, *Casarea dussumieri* (D. & B.).

India. The Recorder has particular pleasure in referring to several publications on Indian Herpetology which appeared in the course of last year. Zoologists resident in the country have begun to pay attention to this branch; and although the determination of the species appears to be still attended with difficulty, owing to the want of a good central collection of well-authenticated specimens, the accounts and descriptions have become much more precise and trustworthy. Of course many additions to the synonymy continue to be made; but this disadvantage is fully counterbalanced by the supplementary information we receive with regard to species previously known.

1. E. NICOLSON: 'Indian Snakes: an elementary treatise on Ophiology, with a descriptive Catalogue of the Snakes found in India and the adjoining countries.' Madras, 1870, 8vo, pp. 118. This little book is useful for the purpose for which it is published, namely, to furnish residents in India with an introduction to the study of Snakes.

2. The Reptiles in the Museum of the Asiatic Society of Bengal have been examined by Mr. W. THEOBALD; and a catalogue of them is published as an extra number of the 'Journal of the Asiatic Society' for 1868 (it reached England in 1870). Some twenty species are described as new; but the majority of those of them which since have been critically examined by others have proved to be known and even common species. This catalogue is not without inaccuracies, but ought to be consulted by all those who require information on species imperfectly described by Blyth. Unfortunately not a few of the typical specimens appear to have been lost.

3. Capt. BEDDOME continues, as we hear, his herpetological studies; but no publication of his appears to have reached this country.

4. Mr. T. C. JERDON has published "Notes on Indian Herpetology" in Proc. As. Soc. Beng. 1870, pp. 66-85. These notes are preliminary to a general work on Indian Reptiles which the author is preparing for the press; and as he intends to compare for this object his specimens with those in the British Museum, we refer in the special part of this Record only to certain more important results of his observations.

5. Dr. F. STOLICZKA's "Observations on some Indian and Malayan Amphibia and Reptilia," in Journ. As. Soc. Beng. 1870, pp. 134-228, pls. 9-12, and Proc. As. Soc. Beng. 1870, pp. 272-275, are evidently the result of careful study. He gives a list of 29 species from the Andaman and of as many from the Nicobar Islands. Eighty-four other Reptiles and Amphibians from various localities are noticed and described in this paper.

6. Finally, Mr. W. T. BLANFORD gives "Notes on some Reptilia

and Amphibia from Central India," in Journ. As. Soc. Beng. 1870, pp. 335-376, with 3 plates. In introductory remarks he objects to views expressed by the Recorder with regard to the distribution of Reptilian types over Peninsular India, and proposes a division more in accordance with his own studies of land-shells, birds, and mammals. The Recorder may reply that he was fully conscious of the imperfect state of information as regards details necessary to subdivide this part of the Indian Region into provinces with definite boundaries, that he, therefore, cautiously abstained from proposing such a division, and that the distribution of Reptilian life in this region, as sketched out by him, is simply a short representation of facts, very few of which have proved to be erroneous. If Mr. Blanford has succeeded in indicating the subdivisions of the western part of the Indian continent, the Recorder will recognize them with pleasure; but the evidence gathered from this class of animals and brought forward by Mr. Blanford at present, in support of his views, is quite inadequate for the purpose. That "in such matters local knowledge is essential" the Recorder can hardly believe, since the main facts of the geographical distribution of animals have been elucidated by men who have seen but a small portion of the globe. An acquaintance with the physical features of a region is necessary, but may be more readily obtained from the works of travellers who have made physical geography their study than by travelling through some parts of the country.

Mr. Blanford, then, divides Peninsular India, with Ceylon, into the following provinces:—1. Punjab; 2. Indian Province proper, with *a.* Gangetic subprovince or Hindustan, *b.* Deccan, *c.* Bengal, *d.* Madras, with Northern Ceylon; 3. Eastern-Bengal province; 4. Malabar, with Southern Ceylon.

Island of Hainan. Mr. SWINHOE enumerates and makes notes on 9 Reptiles and 3 Batrachians from this island. P. Z. S. 1870, pp. 239-241.

Ecuador. X. DE LA ESPADA describes 13 new species of Frogs from Ecuador, the majority being types of new genera. Journ. Sc. Lisb. ix. 1870, pp. 58-65.

ANATOMY AND PHYSIOLOGY.

1. *Separate Publications.*

FÜRBRINGER, M. Die Knochen und Muskeln der Extremitäten bei den schlangenähnlichen Sauriern. Leipzig: 1870, 4to, pp. 136, with 7 plates. [The bones and muscles of the limbs of the Snake-like Saurians.]

The author describes the bones and muscles of the scapular and pelvic arches and limbs of those Saurians in which the extremities are either imperfectly developed or have externally disappeared

entirely. He compares these modifications with the corresponding parts in Saurians with perfectly developed limbs, Amphisbæniæans, and certain Ophidians, and, finally, with the bones and muscles of the limbs of man. In the introduction a list of the Saurians with rudimentary limbs is given.

GEGENBAUR, C. Grundzüge der vergleichenden Anatomie. *Second edition.* Leipzig: 1870, 8vo, pp. 892, with 319 woodcuts.

2. Papers published in Journals.

BAMBEKE, — VAN. Sur les trous vitellins que présentent les œufs fécondés des Amphibiens. Bull. Ac. Belg. 1870, xxx. pp. 58–71, with a plate.

COPE, E. D. On the structural characteristics of the Cranium in the lower Vertebrata. Read before the American Association for the Advancement of Science, 1870. Abstract Amer. Nat. 1870, iv. pp. 505–508.

GEGENBAUR, C. Ueber das Gliedmassenskelett der Enaliosaurier. Jena. Zeitschr. v. 1870, pp. 332–349, Taf. 13.

On the skeleton of the limbs of Enaliosaurians. Important on account of questions of homology.

GULLIVER, G. On the taxonomic characters afforded by the muscular sheath of the œsophagus as regards Sauropsida and other Vertebrata. P. Z. S. 1870, pp. 283–285.

JOLY, N. Sur la rotation de l'embryon dans l'œuf des Axolotls du Mexique. Compt. Rend. 1870, lxx. pp. 873–875.

KLEIN, E. Beiträge zur Kenntniss der Nerven des Froschlärvenschwanzes. SB. Ak. Wien, lxi. 1870, pp. 907–912, with a plate. [Contributions to the knowledge of the nerves in the tail of the Tadpole of the Frog.]

LEVSCHIN, L. Ueber das Lymph- und Blutgefäßsystem des Darmkanals von *Salamandra maculata*. SB. Ak. Wien, lxi. 1870, pp. 67–79, with a plate.

MIVART, St. G. On the axial skeleton of the *Urodela*. P. Z. S. 1870, pp. 260–278, with numerous woodcuts.

——. On the myology of *Chamæleon parsonii*. Ibid. pp. 850–890, with numerous woodcuts.

NATHUSIUS, W. von. Ueber die Schale des Ringelnatterei und die Eischnüre der Schlangen, der Batrachier und Lepidopteren. Zeitschr. wiss. Zool. xxi. 1870, pp. 109–136, Taf. 7. [On the shell of the egg of *Tropidonotus natrix*,

and on the egg-bands of Snakes, Batrachians, and Lepidoptera.]

SANDERS, A. Notes on the myology of *Platydictylus japonicus*. P. Z. S. 1870, pp. 413–426.

STIEDA, L. Studien über das centrale Nervensystem der Wirbelthiere. Zeitschr. wiss. Zool. xxi. 1870, pp. 273–456, Taf. 17–20.

VAUTHERIN, —. Observations sur quelques points de l'organisation des Chéloniens. Ann. Sc. Nat. xiii. 1870, art. 7, pp. 21, with a plate.

CHELONIA.

GRAY, J. E. Supplement to the Catalogue of Shield-Reptiles in the Collection of the British Museum. Part I. *Testudinata* (Tortoises). With figures of the skulls of 36 genera. London: 1870, 4to, pp. 120.

The 'Catalogue of Shield-Reptiles' (Tortoises), published in 1855, contained diagnoses of 167 species, a number increased to 233 in the present supplement. In publishing this supplement, the author's object was not only to embody in it accounts of the species added to the catalogue within the last fifteen years, but also to collect the numerous observations made by him on craniological peculiarities which have led to the subdivision of many groups formerly regarded as generic. As the greater part of these observations have been published by the author previously, we may refer to our abstracts in Zool. Record, vi. pp. 109, 110, ii. pp. 147, 148, &c. Further additions, not previously published, will be mentioned below.

Testudo. Dr. Gray distinguishes 11 species of the group *Peltastes*, which he characterizes, adding a part of the synonymy, P. Z. S. 1870, pp. 653–658. He separates specifically *Testudo platymotus* (Blyth) from *T. elegans* (p. 655), and figures the shell on pl. 33.—*Testudo horsfieldii* is the type of a distinct genus, *Testudinella*, p. 658. See also Suppl. Catal. pp. 8 *et seqq.*

Testudo geometrica. On the great variation of the markings, Giebel, Zeitschr. ges. Ntrw. 1870, xxxv. p. 542.

Mr. Theobald states that *Testudo phayrei* (Blyth) is really a *Testudo*, and not a *Manouria*; he believes that *Testudo (Scapia) falconeri* (Gray) is identical with *T. phayrei*, and asserts that the skull on which *T. falconeri* is founded belongs even to one of the type specimens of *T. phayrei*. P. Z. S. 1870, p. 674. [The evidence taken from the skull contradicts Mr. Theobald's assertion.]

Testudo chilensis, sp. n., Gray, P. Z. S. 1870, p. 706, pl. 40.—Mr. Sclater has no doubt that this species is from La Plata, P. Z. S. 1870, p. 667.—It is the *T. sulcata* of D'Orbigny and Burmeister (not of Miller), Gray, Ann. & Mag. 1870, xi. p. 428.—Mr. Sclater proposes to change the name to *T. argentina*, *ibid.* p. 470.

Testudo elephantopus figured by Gray, P. Z. S. 1870, p. 708, pl. 41.

Cyclemys oldhami. Notes on a specimen supposed to be this species, by Jerdon, Pr. As. Soc. Bengal, 1870, p. 68.

Rhinoclemmys. Dr. Gray has described and figured the specific characters taken from the markings of the head of the following species:—*R. melanosterna*, *scabra*, *mexicana*, and *annulata*. P. Z. S. 1870, pp. 722–724. See also Suppl. Catal. pp. 29 *et seqq.*

Rhinoclemmys mexicana, sp. n., Gray, P. Z. S. 1870, p. 659, with figure of head.

Emys. Dr. Gray has distinguished several generic divisions in this genus, viz. *Ocadia* for *E. sinensis*, *Sacalia* for *E. bealii*, *Redamia* for *E. olivacea*, *Emmenia* for *E. grayi*, Suppl. Catal. pp. 35 *et seqq.*

Damonia (?) *crassiceps*, sp. n., Gray, l. c. p. 43, China.

Emys thurgi is the type of *Hardella* (g. n.), Gray, l. c. p. 58, to which also *Hardella indi*, sp. n., from the Indus, belongs.

Emys belangeri (Less.) = *Geoemyda carinata* (Blyth), different from *Emys trijuga*, according to Jerdon, Pr. As. Soc. Bengal, 1870, p. 69.

Dermatemys. Dr. Gray has reexamined the species of this genus, which he raises to the rank of a family, *Dermatemyidae*. He distinguishes two genera: *Dermatemys* with *D. mawii* and *D. salvinii*, and *Chloremys* (g. n.) with *D. abnormis* as type. P. Z. S. 1870, pp. 711–716. The last-named species is figured on pl. 42. See also Suppl. Catal. pp. 49 *et seqq.*

Kachuga fusca, sp. n., Gray, Suppl. Catal. p. 56, India.

Emys [*Pangshura*] *tectum*, var. *intermedia*, Blanford, J. As. Soc. Beng. 1870, p. 339, pl. 14, Hasdo River.

Pangshura leithi and *Pangshura ventricosa*, spp. nn., Gray, Suppl. Catal. p. 60, India.

Pangshura sylhetensis, sp. n., Jerdon, Pr. As. Soc. Beng. 1870, p. 69; Gray, P. Z. S. 1870, p. 709.—It is the type of a genus, *Jerdonella*, Gray, Suppl. Catal. p. 61.

[*Kinosternum*] *Swanka maculata* and *Swanka fasciata*, spp. nn., Gray, Suppl. Catal. p. 68, Central America.

Chelodina expansa. Shell of young animal figured by Gray, P. Z. S. 1870, pl. 34.

Platemys tuberosa, sp. n., Peters, MB. Ak. Berl. 1870, p. 311, pls. 1 & 2, British Guiana.

Dr. GRAY has observed marked differences in the alveolar portion of the skulls of the Turtles belonging to his family *Peltocephalidae*, which he divides into two tribes, *Peltocephalina* and *Podocnemina*. The latter would comprise *Chelonemys*, *Podocnemys*, and *Bartlettia pitipii*, g. & sp. n., from the Upper Amazons. P. Z. S. 1870, pp. 718–721. The last-named Turtle is described p. 720, and woodcuts of the skull, showing the peculiarity of the jaws, are added.

Trionyx ferox. Notes on its anatomy by Vautherin, Ann. Sc. Nat. xiii. 1870, art. 7, pp. 21, with a plate.

Cyclanosteus senegalensis described and figured from a living example by Gray, P. Z. S. 1870, p. 717, pl. 43.

Emys vittata (Peters?). A specimen described by Blanford, J. As. Soc. Beng. 1870, p. 343.

Dermatochelys coriacea. Notes on its occurrence in China by Swinhoe, P. Z. S. 1870, p. 409.

CROCODILIA.

Crocodylus acutus occurs in Florida. Wyman, Sillim. Journ. 1870, xlix. p. 105.

Crocodylus niger. Note on a specimen from the Bonny River, 4 feet long, by Gray, Ann. & Mag. 1870, vi. p. 427.

RHYNCHOCEPHALIA.

Hatteria is, in the opinion of Prof. Peters, an aberrant form of the *Agama*, resembling *Amblyrhynchus* in the membranous symphysis of the mandible and in the apparent absence of copulatory organs. Sitzgsber. Ges. nat. Freund. Berl. 1870, p. 54. [The Recorder has had an opportunity of showing to Prof. Peters the copulatory organs in a less than half-grown example of *Amblyrhynchus*, and has found them also since in a young *Oreocephalus*. In the adult they must be quite as large as in *Iguana*. Indeed it would have been a matter of surprise if these organs had been absent in the Galapagos Lizards, which are truly Iguanoid genera, and most closely allied to *Iguana*.]

The *Tuatara* lives in sand-holes, F. J. Knox, Tr. N. Z. Inst. ii. 1870, p. 17. Notes on the measurements and weights of parts of the skeleton are added.

LACERTILIA.

Monitor. Notes on this genus by Peters, MB. Ak. Berlin, 1870, pp. 106-110. The author distinguishes six species.

Varanus niloticus (an *V. saurus*?). Notes by Steindachner, SB. Ak. Wien, 1870, lxii. p. 330.

Varanus (Hydrosaurus) mustelinus, sp. n., Borre, Bull. Ac. Belge, xxix. 1870, pp. 122-130, Coast of Guinea.

Psammosaurus scincus occurs in the Punjab, Jerdon, Pr. As. Soc. Beng. 1870, p. 70.

Lacerta ozycephala (Schleg.) figured by Steindachner, SB. Ak. Wien, 1870, lxii. p. 336, taf. 1. figs. 3-6.

Lacerta samharica, sp. n., Blanford, Observ. Geol. & Zool. Abyss. p. 449, with woodcut; and *Lacerta sturti*, sp. n., Blanford, l. c. p. 452, with woodcut; both from Abyssinia.

Zootoca vivipara. Notes by J. Milde, Verh. z.-b. Ges. Wien, 1870, pp. 1033-1036.

Eremias argus figured by Steindachner, l. c. p. 336, taf. 2. figs. 1, 2.

Eremias capensis = *E. laticeps* (Smith), and *E. lugubris* = *E. dorsalis* (D. & B.). Peters, MB. Ak. Berlin, 1870, p. 114.

[*Eremias*] *Acanthodactylus mucronatus*, sp. n., Blanford, Observ. Geol. & Zool. Abyss. p. 453, with woodcut, Abyssinia. [Is an *Eumias*.]

Tachydromus haughtonianus, sp. n., Jerdon, Pr. As. Soc. Beng. 1870, p. 72, Assam.

Cabrita. Mr. Blanford distinguishes *C. brunnea* (Gray), *C. leschenaultii* (M.-Edw.), and *C. jerdoni* (Bedd.). J. As. Soc. Beng. 1870, pp. 345-350.

Ophiops. A number of species belonging to this or closely allied genera have been described during 1870; but as the Recorder is engaged at present in comparing and critically examining typical examples, it may be sufficient to refer to the papers in which they are described: Jerdon, Pr. As. Soc.

Beng. 1870, p. 71; Theobald, Catal. Rept. p. 22 (*Ophiops jerdoni*, Blyth); Blanford, J. As. Soc. Beng. 1870, pp. 350-354.

Cercosaura (*Urosaura*, subg. n.) *glabella*, sp. n., Peters, MB. Ak. Berlin, 1870, p. 641, Sta. Catharina, Brazil.

Hinulia. Dr. Stoliczka refers *Lissonota maculata* (Blyth) to this genus, and describes it. L. c. p. 174.

Hinulia gracilipes, sp. n., Steindachner, l. c. p. 342, taf. 5, Australia.

Eumeces himalayanus (Gthr.) = *Mococa sikimensis* (Blyth). Jerdon, Pr. As. Soc. Beng. 1870, p. 73.

Mabouia. Steindachner (SB. Ak. Wien, 1870, lxii.) describes as new:—*Eumeces* (*M.*) *nattereri*, p. 339, taf. 3. fig. 4, Brazil; *Eu.* (*M.*) *adpersus*, p. 340, taf. 4. fig. 1, Samoa Isl.; *Eu.* (*M.*) *singaporensis*, p. 341, taf. 4. fig. 2.

Mabouia jerdoniana, sp. n., Stoliczka, J. As. Soc. Beng. 1870, pl. 10. fig. 4, islands near Penang.

[*Mabouia*] *Plestiodon scutatus*, sp. n., Theobald, Catal. Rept. p. 25.—Occurs in the Alpine Punjab: Jerdon, P. As. Soc. Beng. 1870, p. 73.

Riopa lineolata, sp. n., Stoliczka, l. c. p. 175, pl. 10. fig. 2, Martaban.

Eumeces (*Senra*) *dumerili*, sp. n., Steindachner, SB. Ak. Wien, 1870, lxii. p. 341, taf. 3. fig. 5, Zanzibar.

Eumecia, g. n. Scincid., Bocage, Journ. Sc. Lisb. ix. 1870, p. 66. Corps assez allongé, légèrement aplati sur le dos et comprimé latéralement; queue longue, également comprimée des deux côtés; deux paires de membres très courts, les antérieurs de moitié plus courts que les postérieurs et à deux doigts petits et presque égaux, les postérieurs à trois doigts, l'interne très petit, les autres presque égaux. Narines percées dans une seule plaque, la nasale, à son angle supérieur, qui se trouve précisément au point de contact de la supéro-nasale et de la naso-frénale. Paupière inférieure à disque transparent. Langue squameuse, plate, très faiblement incisée à son extrémité antérieure. Ecailles lisses.—*Eumecia anchietæ*, sp. n., Bocage, l. c. p. 67, pl. 1, Mossamedes. Scales in 24 rows.

Tropidolepisma striolatum, sp. n., Peters, MB. Ak. Berlin, 1870, p. 642, N.E. Australia.

Tiliqua rugifera, sp. n., Stoliczka, J. As. Soc. Beng. 1870, p. 170, pl. 10. fig. 3, Nicobars.—*Euprepes* (*Tiliqua*) *septemlineatus*, sp. n., Blanford, ibid. p. 360, pl. 16. figs. 7, 8, South-eastern Berar.

Tiliqua macularia (Blyth). Notes by Blanford, l. c. p. 358.

Euprepes perotteti (D. & B.), an = *Eup. pleurostictus* (Ptrs.)? Steindachner, SB. Ak. Wien, 1870, lxii. p. 331.

Euprepes damaranus, sp. n. (?), Steindachner, l. c. p. 338, taf. 3. figs. 1-3.

Euprepes innotatus, sp. n., Blanford, J. As. Soc. Beng. 1870, p. 354, pl. 16. fig. 9, from South-eastern Berar.

Sphenocephalus tridactylus found in the Punjab. Jerdon, Pr. As. Soc. Beng. 1870, p. 74.

Hemidactylus variegatus (Ptrs. in Deeken's Reis. iii. p. 13).—The name is changed into *H. picturatus*, Peters, MB. Ak. Berlin, 1870, p. 116.

Hemidactylus muriceus, sp. n., Peters, l. c. p. 641, Guinea. (*Hemidactylus fasciatus* = *Livrus ornatus*.)

Hemidactylus affinis, sp. n., Steindachner, SB. Ak. Wien, 1870, lxii. p. 328, West Africa and Sicily.

Hemidactylus gracilis and *H. marmoratus*, spp. nn., Blanford, J. As. Soc. Beng. 1870, pp. 362, 363, pl. 16, from South-eastern Berar.

Hemidactylus frenatus and *maculatus*. Notes by Stoliczka, Journ. As. Soc. Beng. 1870, p. 164.

Peripia peronii. Notes by Stoliczka, *l. c.* p. 163.

Pentadactylus khasiensis, sp. n., Jerdon, Pr. As. Soc. Bengal, 1870, p. 75.

Gecko. Dr. Stoliczka has published some notes on *G. guttatus*, *G. stentor*, and *G. smithii*, J. As. Soc. Beng. 1870, pp. 160, 161.

Platyedactylus japonicus. A detailed description of its myology by A. Sanders, P. Z. S. 1870, pp. 413-426.

Phelsuma grandis, sp. n., Gray, Ann. & Mag. 1870, vi. p. 191, Madagascar. [= *Ph. cepedianum*.]

Phelsuma andamanense described by Stoliczka, *l. c.* p. 162.

Cyrtodactylus. Dr. Stoliczka refers *Puellula rubida* (Blyth) to this genus, and describes it, *l. c.* p. 165.—*Cyrtodactylus affinis*, sp. n., Stoliczka, *l. c.* p. 167, pl. 10. fig. 1, Penang.

Gymnodactylus kotschy, sp. n. (?), Steindachner, SB. Ak. Wien, 1870, lxii. p. 329, taf. 1. figs. 1, 2, Gorea.—*Gymnodactylus girardi*. Notes by Steindachner, *ibid.* p. 344.

Gymnodactylus jerdonii, sp. n., Theobald, Catal. Rept. p. 31; hab. — ?

Gymnodactylus. *Nautilinus variegatus* (Blyth) = *N. fasciolatus*, according to Theobald, *l. c.* p. 32; and is a *Gymnodactylus* according to Stoliczka, J. As. Soc. Beng. 1870, p. 167.

Chondrodactylus, g. n., Peters, MB. Ak. Berlin, 1870, p. 110. Differs a *Stenodactylus* unguum defectu, pholidosi notæi heterogenea.—*Ch. angulifer*, sp. n., Peters, *l. c.* p. 111, fig. 1, S.W. Africa.

Stenodactylopsis pulcher, g. et sp. n., Steindachner, *l. c.* p. 343, taf. 2. figs. 3-5, Swan River.

Teratolepis. Notes on the typical *Homonota fasciata* by Theobald, Catal. Rept. p. 32.

Sitana. Notes on the species by Jerdon, Pr. As. Soc. Beng. 1870, p. 76, and by Blanford, J. As. Soc. Beng. 1870, pp. 365-368.

Tiaris subcristata. *Coryphophylax maximiliani* (Steindachner) proves to be this species. Stoliczka, *l. c.* p. 180.

Iapakura swinhonis found in China by Swinhoe, P. Z. S. 1870, p. 411.

Iapakura microlepis and *planidorsata*, spp. nn., Jerdon, Pr. As. Soc. Beng. 1870, p. 76, Sikkim and Khasia Hills.

Orioliaris elliotti (Gthr.) = *Calotes tricarinatus* (Blyth), Jerdon, *l. c.* p. 77.

Bronchocele. Notes on *Br. cristatella*, *moluccana*, and *jubata*, by Stoliczka, J. As. Soc. Beng. 1870, pp. 178, 179.

Calotes marieæ (Gray) = *C. platyceps* (Blyth) and *Calotes jerdonii*, sp. n., from Khasya, described and figured by Günther, P. Z. S. 1870, p. 778, pl. 45.

Oriocalotes major, sp. n., Jerdon, *l. c.* p. 77, Sutlej valley.

Charasia dorsalis. Notes by Blanford, J. As. Soc. Beng. 1870, p. 368.

Agama hispida (L.) = *A. aculeata* et *spinosa* (D. & B.), and *A. atra* (Daud.) = *A. atra* et *capensis* (Gray). Peters, MB. Ak. Berlin, 1870, pp. 112, 113.

Agama annectens, sp. n., Blanford, Observ. Zool. & Geol. Abyss. p. 446, with woodcut, Abyssinia.

Lirolepis guttatus. On its habits, Swinhoe, P. Z. S. 1870, p. 240.

Chamæleo parsonii. A detailed account of its myology by St. G. Mivart, P. Z. S. 1870, pp. 850-870, with numerous woodcuts.

Chamaeleon vulgaris. Notes on an Indian example by Stoliczka. Proc. As. Soc. Beng. 1870, pp. 1, 2.

A *Chamaeleon* kept in captivity (*sp.* — ?) has brought forth living young. Moore, Proc. Lit. & Phil. Soc. Liverp. 1869, p. 49.

OPHIDIA.

Calamaria sumatrana and *Calamaria hoevenii* are said to be new species from Sumatra. Edeling, Nat. Tyds. Ned. Ind. 1870, pp. 379, 380. The same author describes *Calamaria leugocaster* and *C. melanorhynchos* of Bleeker.

Calamaria reticulata (Blyth) redescribed by Theobald, Catal. Rept. p. 44, is the type of a new genus, *Blythia*. [Is probably an *Orycalamus*.]

Geophis annulatus, *sp. n.*, Peters, MB. Ak. Berlin, 1870, p. 643, taf. 1. fig. 2, South America ?

Ficimia olivacea figured by Steindachner, SB. Ak. Wien, 1870, lxiii. p. 344, taf. 6.

Uriechis (*Metopophis*, subg. n.) *lineatus*, *sp. n.*, Peters, l. c. p. 643, taf. 1. fig. 3, Guinea.

Simotes obscurus and *Simotes crassus*, *spp. nn.*, Theobald, Cat. Rept. p. 48, hab. — ?

Ablabes bicolor is the type of a new genus *Grotea*, according to Theobald, l. c. p. 45.

Ablabes nicobariensis, *sp. n.*, Stoliczka, J. As. Soc. Beng. 1870, p. 184, pl. 11. fig. 1.—*Ablabes scriptus* (Blyth, MS. ?), *sp. n.*, Theobald, l. c. p. 49, Martaban.

Falconeria bengalensis, *g. et sp. n.* (Calamariid.), Theobald, Catal. Rept. p. 44. Scales faintly keeled, in 17 rows. One anterior frontal; two posterior frontals entering the orbit. Five upper labials. Loreal one. Præocular very elongate. Anal and subcaudals bifid. From Parisnath.

Enicognathus javanicus described by Edeling, Nat. Tyds. Ned. Ind. xxxi. 1870, p. 386.

Cyclophis catenatus, *sp. n.*, Theobald, l. c. p. 49, Simla.—*C. rubriventer*, *sp. n.*, Jerdon, Pr. As. Soc. Beng. 1870, p. 80, Khasia Hills.

Chlorophis oldhami, *g. et sp. n.*, Theobald, Catal. Rept. p. 50, Simla.

Coleber nuthalli, *sp. n.*, Theobald, l. c. p. 51, Birma.

Composoma semifasciatum (*Platyceph semif.*, Blyth) redescribed by Theobald, Cat. Rept. p. 52; and by Stoliczka, J. As. Soc. Beng. 1870, p. 188.

Zamenis brachyurus found in South-eastern Berar. Blanford, J. As. Soc. Beng. 1870, p. 372.

Herpetodryas quinquelineatus, *sp. n.*, Steindachner, SB. Ak. Wien, 1870, lxii. p. 346, Brazil.—*Herpetodryas affinis*, *sp. n.*, Steindachner, l. c. p. 348, taf. 7. figs. 4 & 5, Brazil.

Philodryas nattereri, *sp. n.*, Steindachner, l. c. p. 345, taf. 7. figs. 1–3, Matogrosso.

Tropidonotus natrrix ? On a singular example with 20 series of scales in the Museum at Bern, believed by the author to be a new species, Studer, Mittheil. ntrf. Ges. Bern, 1870, p. 24, with figure of head.

Tropidonotus tytleri (Blyth) = *Tr. quincunciatus*, Stoliczka, J. As. Soc. Beng. 1870, p. 190.

Tropidonotus punctulatus is described as *Fowlea peguensis* (*g. et sp. n.*) by Theobald, Cat. Rept. p. 57.

Cadmus cuneiformis, g. et sp. n., Theobald, l. c. p. 53, from Simla. Is described as a *Tropidonotus*-like Snake with the scales in 27 rows, and cuneiform snout.

Cantoria dayana, sp. n., Stoliczka, J. As. Soc. Beng. 1870, p. 208, pl. 11. fig. 5, Moulmein River.

Scaphiophis, g. n., Peters, MB. Ak. Berlin, 1870, p. 644. Habitus as of *Rhamphiophis*. Dentition isodont. Rostral shield very large, convex above, concave below, with a projecting trenchant edge. Nostrils between two nasals and the prefrontal. Loreal present; orbit surrounded by small orbitalia. Scales smooth. Anal and subcaudals paired. *Scaphiophis albopunctatus*, sp. n., Peters, l. c. p. 645, taf. 1. fig. 4, Guinea. Scales in 23 series: 210 ventrals, 64 subcaudals.

Psammophis condanarus is described as *Phayrea isabellina*, g. et sp. n., by Theobald, Cat. Rept. p. 51.

Dendrophis caudolineolata (Gthr.) is described as *Dendrophis caudolineata* by Stoliczka, J. As. Soc. Beng. 1870, p. 194.

Tragops fronticinctus. Notes by Stoliczka, l. c. p. 197.

Dipsas. Dr. Stoliczka (l. c.) describes *D. hexagonata* (Blyth), p. 198, pl. 11. fig. 4; and *D. multifasciata* (Blyth, 1861), which appears to be identical with *D. ceylonensis* (1858), p. 199, pl. 11. fig. 6.

Dipsas. Edeling (Nat. Tyds. Ned. Ind. 1870, pp. 383, 385) describes two snakes from Sumatra, under the Bleekerian names of *Pareas dorsopictus* and *Pareas waandersii*. [The latter has long been known to be the common *Dipsas cynodon*.]

Lycodon aulicus is described as *Tytleria hypsirhinoides*, g. et sp. n., by Theobald, Cat. Rept. p. 66.

Lycodon striatus obtained at Simla. Stoliczka, J. As. Soc. Beng. 1870, p. 200.

Tetragonosoma effrene figured by Stoliczka, l. c. p. 203, pl. 11. fig. 3.

Pareas berdmorei, sp. n., Theobald, Cat. Rept. p. 63, Tenasserim and Martaban [is = *Pareas margaritophorus*, Jan].

Stoliczka khasiensis, g. et sp. n., Jerdon, Pr. As. Soc. Beng. 1870, p. 81. *Incertæ sedis*.

Hoplocephalus frenatus, sp. n., Peters, MB. Ak. Berlin, 1870, p. 646, Lake Elphinstone.

Callophis. Dr. Meyer has now examined nearly all the species of this genus without finding the enlarged poison-glands in any of them except in *C. intestinalis* and *bivirgatus* (see Zool. Record, vi. p. 118). P. Z. S. 1870, p. 368.

Hydrophis guntheri and *Hydrophis trachyceps*, spp. nn., Theobald, Cat. Rept. pp. 69, 70.

Enhydrina. Dr. Stoliczka distinguishes *E. bengalensis* from *E. schistosa*. Journ. As. Soc. Beng. 1870, p. 213.

Trimeresurus mucrosquamatus occurs in Formosa, and is figured by Swinhoe, P. Z. S. 1870, p. 411, pl. 31.

Trimeresurus andersoni and *Trimeresurus obscurus*, spp. nn., Theobald, Cat. Rept. pp. 75, 76; hab. —?—Stated to be the same species by Stoliczka, J. As. Soc. Beng. 1870, p. 216.

Trimeresurus. Dr. Stoliczka (l. c.) has published notes on the common species, and describes *T. mutabilis*, sp. n., from the Nicobars, p. 219, pl. 12.

fig. 5; *T. cantor* (Blyth), p. 222, pl. 12. figs. 3, 4; *T. convictus*, sp. n., from Penang, p. 224, pl. 12. fig. 1.

Bothrops (Teleuraspis) nigroadpersus, sp. n., Steindachner, SB. Ak. Wien, 1870, lxii. p. 348, taf. 8, Central America.

BATRACHIA SALIENTIA.

A. W. AITKEN has observed that in tropical parts of Australia certain Frogs form a hollow ball of clay containing about half a pint of clear cold water, in which they sojourn during the drought. Tr. N. Z. Inst. ii. 1870, pp. 87-88.

Dactylethra laevis found in Abyssinia. Blanford, Observ. Abyss. p. 459.

Oxyglossus lima and *laevis* described by Dr. Stoliczka, P. As. Soc. Beng. 1870, p. 272. The latter species occurs also in Birma.

Rana gracilis very variable according to Stoliczka, who describes some varieties. J. As. Soc. Beng. 1870, p. 142.

Rana longirostris, sp. n., Peters, MB. Ak. Berlin, 1870, p. 646, taf. 1. fig. 5, Guinea.

Pyxicephalus breviceps at an altitude of 7000 feet. Stoliczka, l. c. p. 147.

Tomopterna natalensis (Smith) = *T. labrosa* (Cope). Günther, P. Z. S. 1870, p. 401.

Cystignathus diploistris, sp. n., Peters, MB. Ak. Berlin, 1870, p. 648, taf. 2. fig. 2, North Brazil.

Entomoglossus, g. n. Cystignathid., Peters, l. c. p. 647. Tongue deeply notched.—*E. pustulatus*, sp. n., tab. 2. fig. 1, North Brazil.

Edalorhina, g. n. Discoglossid. (?), X. de la Espada, Jorn. Lish. ix. 1870, p. 58. Caput parvum, productum, compressum, rostro simato; collum prismaticum, lateraliter planum et perpendiculare; nares tumidae approximatae, earum rimae laterales, ovaes, obliquae, retroversim patulae; palpebrae tuberculis tribus longis mamillatis acuminatae; tympanum perspicuum; palatum dentatum, dentibus obtusis, acervis duabus obliquis inter nares dispositis; lingua magna ovalis, praelonga medio elevata, antice angustata, postice sinuata, dimidio posteriori lateribusque libera; digitus podium anticorum liberi, primus secundus et quartus aequales, posticorum palama brevi coadunati, marginati; notæum valde depressum vel planum, pachydermum, plica marginali cutanea circumdanti, projecta expansum gastræum convexum; processus vertebrae sacralis dilatati; parotidæ nullæ.

Edalorhina perezi, sp. n. *E.* supra rubro nigricante, extremitatibus dilutioribus; subtus albo-margaritacea, maculis præmagnis fere nigris simetricis marmorata. Fronte trituberculata; dorso tuberculis quatuor in quadrangulum dispositis; femoribus monotuberculatis; cruribus ad medium perisceliis torosis ornatis. *Hab.* in Ecuador; ad ripas flum. Napo.

Bombinator sikkimensis (Blyth) is the type of a distinct genus, *Scutigera*, according to Theobald, Cat. Rept. p. 83.

Nannophryne, g. n. Brachycephalin., Günther, P. Z. S. 1870, p. 401. Tongue entire behind. A pair of parotoids on each side, beside other similar smaller glands scattered on the body and legs. Hind toes slightly webbed. A blunt tubercle at the base of the first toe.—*Nannophryne variegata*, sp. n., ibid. p. 402, pl. 30. figs. 1 & 2, from the Magellan Straits.

Ansonia penangensis, g. n. (Rhinodermatid.) et sp. n., Stoliczka, J. As. Soc. Beng. 1870, p. 152, pl. 9. fig. 4.

Diploelma carmaticum figured by Stoliczka, l. c. p. 154, pl. 9. fig. 5.

Bufo viridis found in the Sutlej valley, and at an altitude of 15,000 feet, by Stoliczka, l. c. p. 155.

Bufo spinipes from the Nicobars = *B. melanostictus*, according to Stoliczka, l. c. p. 156 [cf. Zool. Rec. iv. p. 146].

Hylorana erythræa. A specimen from Dacca, in the Calcutta Museum, is described as *H. tyleri* (sp. n.) by Theobald, Cat. Rept. p. 84, and figured by Stoliczka, J. As. Soc. Beng. 1870, pl. 9. fig. 1.

Hylorana nicobariensis, sp. n., Stoliczka, l. c. p. 150, pl. 9. fig. 2.

Izalus cinerascens, sp. n., Stoliczka, P. As. Soc. Beng. 1870, p. 275, Tenasserim.

Megalizalus infrarufus (see Zool. Record, v. p. 129) is from the Seychelles. Günther, P. Z. S. 1870, p. 150.

Polypedates variabilis (Jerd.) = *P. pleurostictus* (Gthr.). Jerdon, Pr. As. Soc. Beng. 1870, p. 83.

Polypedates hascheanus, sp. n., Stoliczka, J. As. Soc. Beng. 1870, p. 147, pl. 9. fig. 3, Penang.

Rappia tuberklinguis (Sundev.) figured by Peters, MB. Ak. Berl. 1870, p. 115, fig. 3.

Arthroleptis dispar, sp. n., Peters, l. c. p. 649, tab. 2. fig. 3, Ilha do Principe. — The author remarks that *Heteroglossa africana* (Hallowell) belongs to this genus, which is so nearly allied to *Rappia*, that it can scarcely be regarded as a subgeneric division of it.

Arthroleptis wahlbergii (Smith) figured by Peters, l. c. p. 115, fig. 2.

Hyloxalus, g. n. Polypedatid., Espada, Jorn. Lisb. ix. 1870, p. 59. Habitus capitis *Hylaplesinus*; rostrum processum, rotundatum; dentes palatini nulli; lingua triangularis, integra, postice lateraliterque libera; tympanum perspicuum; digiti antepedum liberi, pedum posticorum palama tenui, connati; omnes phalangibus extremis in figuram Y constructis, disco apicali mediocre, adherente, transverso muniti. — *Hyloxalus fuliginosus*, sp. n., ibid., from Ecuador. *H.* lingua dimidio posteriori libera; plantis semipalmatis. Supra fuscus; minute granulatus; subtus, gula excepta, levis, albidus.

Hyloxalus bocagei, sp. n., ibid., from Ecuador. *H.* lingua tertio anteriori solum adherente; plantis fere omnino palmatis; cute undique omnino lævis-sima. Fusco-ater; gula, pectore lateribusque ex fusco vel fusco-nigro et albido marmoratis.

Phyllobates verruculatus, sp. n., Peters, MB. Ak. Berlin, 1870, p. 650, Mexico.

Hylodes henseli, sp. n., Peters, l. c. p. 648, South Brazil. — *Hylodes rugulosus*, sp. n., Peters, l. c. Sta. Catharina.

Limnophys, g. n. Hyloid., Espada, Jorn. Sc. Lisb. ix. 1870, p. 59. Habitus qualis est *Hemiphractus*; caput latissimum, amplitudine sua maximam longitudinem trunci æquante, regione maxillari extensa, spatio inter-orbitario brevissimo, in medio canaliculato et in lateribus cristis duabus a nucha in una eademque linea cum cantho rostrali obductis relevato; canthus rostralis altus, scabrosus ejusdem eminentiis fere parallelis; oculi mediocres; palpebra crassa, tuberculosa; tympanum perspicuum, grande, circulare; lingua integerrima, tertio posteriori lateribusque libera; dentes palatini in seriebus duabus con-

tiguis, pone nares internas remote dispositi; earum rimæ rotundæ, sed non magis quam tubæ Eustachii patulæ; digiti omnes liberi, tereti, disco apicali minutissimo, globulari, eminentiis infraarticularibus in plantis majoribus muniti; cutis supra adeo verrucosa, longitudinaliter plicata, infra lævis.—*Limnophys cornutus* and *L. napæus*, spp. nn., Espada, l. c. p. 60, Ecuador.

Pristimantis, g. n. Hyloiid., Espada, l. c. p. 61. Habitus gracillimus; caput elongatum, triangulare, rostro perpendiculariter truncato, cantho rostrali acuto, vertice plano ad latera cristis binis osseis compressis, acie serrato, supra nucham elatioribus, armato et crista alia robusta scabrosa super tympanum projecta; tympanum conspicuum; lingua ovalis, tertio postico lateribusque libera, dentes palatini in series duas parallelas, longitudinales, ante paullulum incurvatas, pone nares internas dispositi easque tangentes; digiti omnes liberi, longissimi, gracillimi, eorum phalanges extremæ formam litteræ T æmulantes, ut discos amplissimos, rotundos, complanatos sustineant.—*Pristimantis galdi*, sp. n., Espada, l. c., Ecuador.

Cerathyla, g. n. Hylin., Espada, Jorn. Sc. Lisb. ix. 1870, p. 63. Habitus *Hylinus*; caput cristatum, tuberculosum, tertiarium corporis longitudine occupans, fronte pentagonali, ejus circuito relevato; dentes palatini transversim et oblique dispositi; [dentes mandibulares;] lingua integerrima; tympanum retroversum; nares rotundæ, earum meatus palatinus oblongus; hircus ante semicircularis, pone subquadrus et a nucha proximus; maniculæ elongatæ, digitis compressis nodosis, tertio et quarto usque ad basim phalangium conferte coadunatis, omnibus, necnon in podiis, discum planum, transversum amplum ferentibus; pedes palama brevi muniti.

Cerathyla proboscidea, sp. n., Espada, l. c. p. 65. C. supra minute granulosa; subtus ad lateraque adeo vesiculosa; capite depresso; rostro appendice cutanea proboscidea, compressa, apice bifida, basi dentata, producto; mucronibus tympanicis plica dermoica elongatis; palpebra superiore elata, acuminata. Ecuador.

Cerathyla bubalus, sp. n., Espada, l. c. C. capite subdepresso, subproducto, pentagono frontale eminente; ambitu maximo sinuus occipitalis distantie a cuspidē tympanica usque apice rostri æquo, capite latiore; palpebra superiore rotundata; rostro mucronibusque tympanicis appendicula cutanea instructis; perisceliis tantum cruralibus apparentibus. Ecuador.

Cerathyla palmarum, sp. n., Espada, l. c. C. capite subconvexo, pentagono frontali valde relevato; diametro maximo sinuus occipitalis distantie a cuspidē tympanica usque ad nares æquo, amplitudine capitis breviorē; rostro mucronibusque occipitalibus appendicula cutanea instructis; palpebra superiore rotundata; perisceliis femoralibus atque cruralibus apparentibus. Ecuador.

Cerathyla braconieri, sp. n., Espada, l. c. C. corpore artubusque, præsertim posticis, gracillimis; supra lævis, subtus lateraliterque adeo vesiculosa, vesiculis pilatis; capite subconvexo, valido, rudi; ejusdem eminentiis rugosis, depressis, veluti contusis; cuspidibus tympanicis fere obtusis; earum intervallo ambitum inter nares et cuspidē æquante; rostro appendice cutaneo brevissimo instructo; palpebra superiore rotundata. Ecuador.

Litoria aurea. A variety with black reticulations on the abdomen figured by Günther, P. Z. S. 1870, p. 402, pl. 30. fig. 3.

Hyla reticulata, sp. n., Espada, Jorn. Sc. Lisb. ix. 1870, p. 61. H. capite elevato, antice rotundato, vertice horizontali, fronte decliva, rostro perpendiculari, cantho rostrali vix conspicuo; oculis præmagnis, protuberantibus,

tympano a cute paulo distincto; lingua subcordiformi, longitudinaliter sulcata, lateribus margineque tantum postica libera; palmis semipalmatis, plantarum palama usque ad basim penultimarum phalangium obducta, cute undique lævigata, abdomine natibusque infra exceptis; supra viridi-euphorbiacea, maculis rotundatis magnis aurantiacis ad dorsum guttata, ad rostrum, genas, latera et artus pulcherrime reticulata. Ecuador.

Nototrema testudineum, sp. n., Espada, Journ. Lisb. ix. 1870, p. 62. *N.* undique ex griseo-plumbeo cinerascens; artubus obsolete zonatis; capite lævigato, depresso, rotundato; fronte ampla, concava; cantho rostrali tereti; tympano ovale, antice parum conspicuo; apice digitorum omnium valde expanso, discoideo; cute ad dorsum squamis veluti fractis indurata, super occipitio arcuatum plicata. Ecuador.

Calula pulchra. Notes by Stoliczka, J. As. Soc. Beng. 1870, p. 155.

Dendrophryniscus, g. n., Espada, Journ. Sc. Lisb. ix. 1870, p. 65. Type of a separate group, *Dendrophryniscina*. Maxillæ edentulæ, auris imperfecta [?]; dentes palatini nulli; parotoides nullæ; processus vertebræ sacralis non dilatati; pedes palmati. Caput depressum, triangulare, rostro ad instar *Ateopos* productum; auris sub cute latens [?]; lingua angustata, integra, oblonga, dimidio posteriore libera; nares interiores magnæ; tubæ Eustachii fere inconspicuæ; digiti omnes disco adherenti munitis, in maniculis liberi, in podiis depressi, marginati, palama basilari connati; discii manuum transversii, pollice excepto, pedum elongati amplitudine phalanges haud excedentes; cutis, supra tuberculosa, infra papillosa.

Dendrophryniscus brevipollicatus, sp. n., Espada, l. c. *D.* fronte plana; rostro canaliculato; oculis magnis; pollice brevissimo, ejus disco adherente parvo, rotundo; tuberculis ad dorsum aspersis, minutis, ad regiones paroticas, superfemorales axillaresque majoribus confertis; infra undique papillosus. Supra ex rubro fuscus, tænia saturatiore nates atque cruras ornante; subtus dilute badius.—*Hab.* prope Rio de Janeiro, in monte Corcovado.

Cophomantis, g. n., Peters, MB. Ak. Berlin, 1870, p. 650, appears to differ from *Dendrophryniscus* in having teeth on the palate. *Cophomantis punctilata*, sp. n., Peters, l. c. p. 651, taf. 2. fig. 4, Sta. Catharina.

BATRACHIA GRADIENTIA.

STRAUCH, A. Revision der Salamandriden-Gattungen nebst Beschreibung einiger neuen oder weniger bekannten Arten dieser Familie. Mém. Ac. Sc. St. Pétersb. xvi. no. 4, 1870, pp. 109, with two plates.

In this carefully prepared memoir the author reviews critically the systematic divisions proposed by Herpetologists. He considers those introduced by Merrem and Gray to be the most natural; whilst Mr. Cope's most recent attempts at classification have led to most artificial divisions, or, as in the *Salamandridæ*, have left the system as previously established by Gray and Hallowell. He admits two families of the *Batrachia gradientia*, viz. *Ichthyoida* and *Salamandrida*. Only the latter family is the subject of the present memoir. The author divides it into two Tribes, viz. *Mecodontæ* (= *Salmandridæ*, Gray) and *Lechriodontæ* (= *Molgidae* + *Plethodontidae*, Gray). He admits 19 genera, with 84 species. The genera are characterized; but only the minority

of the species could be worked out critically, the author's materials being insufficient for that purpose. However, his list of species may be considered to be complete to the year 1867 (*incl.*). The memoir is concluded with a sketch of the geographical distribution of these Amphibians. They appear to indicate the following divisions:—

- I. Eastern Hemisphere, with 28 species.
 - A. Circummediterranean District, with 19 species.
 - 1. European Province, with 15 species.
 - 2. African Province, with 3 species.
 - 3. Asiatic Province, with 5 species.
 - B. Asiatic District, with 9 species.
 - 1. Western Siberia, with 1 species.
 - 2. Eastern Siberia, with 2 species.
 - 3. Japan, China, Siam, with 6 species.
- II. Western Hemisphere, with 57 species.
 - A. Pacific District, with 25 species.
 - 1. Northern Province, with 15 species.
 - 2. Southern Province (from Mexico southwards), with 10 species.
 - B. Atlantic District, with 32 species.
 - 1. Province West of Mississippi, with 13 species.
 - 2. Province East of Mississippi, with 28 species.

With regard to the distribution of the *genera*, nine are peculiar to the Eastern, seven to the Western Hemisphere, whilst three are common to both.

Mr. St. G. MIVART has published a memoir on the axial skeleton of the *Urodela*. Proc. Zool. Soc. 1870, pp. 260–278, with numerous woodcuts.

Triton. Dr. Strauch (*l. c.*) describes *T. karelinii*, sp. n., from North-eastern Persia, p. 42, tab. 1. fig. 1; *T. longipes*, sp. n., from Astrabad (Persia), p. 44, fig. 2; and figures *T. ophryticus* (Berth.), fig. 3, and *T. cristatus*, fig. 4.

Salamandrella keyserlingii, g. et sp. n., Dybowski, Verh. z.-b. Ges. Wien, 1870, p. 237, taf. 7, = *Isodactylium schrenckii* (g. et sp. n.), Strauch, *l. c.* p. 56, taf. 2. fig. 1 (skull); distinguished from *Ellipsoglossa* by having four toes only, from Eastern Siberia. A second species from Kamtschatka is *Isodactylium wosnessenskyi*, sp. n., Strauch, *l. c.* p. 58, tab. 2. fig. 2.

Ranodon sibiricus (Kessler) = *R. kessleri* (Ballion) figured by Strauch, *l. c.* p. 66, taf. 2. fig. 3.

Ensatina eschscholtzii (Gray) is different from *Triton ensatus* (Eschsch.), which is the type of a new genus, *Dicamptodon*, Strauch, *l. c.* p. 68.

Plethodon flavipunctatus, sp. n., Strauch, *l. c.* p. 71, California.

Spelerpes. Cirri dependent from the upper lip, near the nostril, are sometimes observed in not fully developed examples (*Sp. cirrigera*, Green). Cope, Amer. Nat. 1870, iv. p. 401.

Siredon. A. Duméril has bred albinos; none of the examples which underwent a metamorphosis are sexually mature. Bull. Acclim. 1870, pp. 266–270; or Compt. Rend. 1870, lxx. pp. 782–785.—A specimen which changed into the *Amblystoma*-state figured by Tegetmeier, P.Z.S. 1870, p. 160.

PISCES

BY

ALBERT GÜNTHER, M.A., M.D., PH.D., F.R.S.

General Works.

- GÜNTHER, A. Catalogue of the Fishes in the British Museum. London, 1870, 8vo, vol. viii. pp. 549.

This work is concluded with the present volume, which contains the *Gymnotidæ*, *Symbranchidæ*, *Muraenidæ*, *Pegasidæ*, *Lophobranchii*, *Plectognathi*, *Dipnoi*, *Ganoidei*, *Chondropterygii*, *Cyclostomata*, and *Leptocardii*.

The advancement of ichthyology since the publication of the first volume, in 1859, has been so rapid, and the additions made to the British-Museum collection are so numerous, that it will be necessary to issue a supplementary volume, or to republish the earlier volumes of the work.

- DUMÉRIL, A. Histoire naturelle des Poissons ou Ichthyologie générale. Tome II. Ganoïdes, Dipnés, Lophobranches. Paris, 1870, 8vo (pp. 624, with an Atlas in 8vo, containing 12 plates).

The scope and object of this work, of which the first volume appeared in 1865, has been described in Zool. Rec. ii. p. 163. The author gives a detailed account of the literature and anatomy of the Ganoid and Dipnoous Fishes, chiefly from the works of preceding anatomists. The anatomy of the Lophobranchs is not further worked out; and the *Pegasidæ* are still included in that order. In some of the groups, especially North-American genera, minute specific division is carried even beyond the point reached in recent publications of Blanchard and Guichenot; and it will require much labour on the part of coming ichthyologists to sift "good" species out of the mob of names given to individual museum-specimens. Some portions (as, for instance, part of the account of the Sturgeons) were published by the author in previous years; and other parts of the MS. (like that referring to the air-bladder of Ganoids) were reprinted by him in some provincial periodicals, to which, therefore, no further reference is required.

1870. [VOL. VII.]

- BLEEKER, P. Atlas Ichthyologique des Indes Orientales Néerlandaises. See Zool. Rec. i. p. 134, ii. p. 163, vi. p. 123.

In the year 1870, livr. 22 & 23 have been issued, containing the text to the *Pleuronectidæ*, and plates representing part of the *Percidæ* and *Chupeidæ*.

Anatomical and Physiological Publications.

- GEGENBAUR, C. Grundzüge der vergleichenden Anatomie. Second edition. Leipzig, 1870, 8vo, pp. 892, with 319 woodcuts.
- BAUDELOT, —. Étude sur l'anatomie comparée de l'encéphale des Poissons. Mém. Soc. Sc. Nat. Strasbourg, vi. 1870, pp. 51–128, with a plate.
Another plate is added to this memoir, illustrative of a previous paper by the same author on the first vertebræ of Cyprinoids and Siluroids in Bull. Soc. Hist. Nat. Strasb. 1868. (See also Zool. Record, v. p. 136.)
- FÉE, F. Recherches sur le système lateral du Nerf pneumogastrique des Poissons. Mém. Soc. Sc. Nat. Strasb. vi. 1870, pp. 129–201, with 4 plates.
- GEGENBAUR, C. Ueber das Skelett der Gliedmaassen der Wirbelthiere im Allgemeinen und der Hintergliedmaassen der Selachier insbesondere. Jena. Zeitschr. v. 1870, pp. 397–447, with woodcuts and two plates. [On the skeleton of the limbs of Vertebrates generally, and of the hind limbs of Selachians especially.]
- HUMPHRY, G. M. On the homological relations to one another of the mesial and lateral fins of Osseous Fishes. Journ. Anat. and Physiol. v. 1870, pp. 59–66, with a plate.
- LANGER, C. Ueber Lymphgefässe des Darms einiger Süsswasserfische. SB. Ak. Wien, lxii. 1870, pp. 161–169, with a plate. [On the lymphatic vessels in the intestinal tract of some freshwater fishes (Cyprinoids).]
- MIKLUCHO-MACLAY, N. VON. Beiträge zur vergleichenden Neurologie der Wirbelthiere. I. Das Gehirn der Selachier II. Das Mittelhirn der Ganoiden und Teleostier. Leipzig, 1870, 4to, pp. 74, with 7 plates.
- SMITH, J. ALEX. Notice of true hermaphroditism in the Codfish (*Morrhua vulgaris*) and in the Herring (*Chupea harengus*). Journ. Anat. & Physiol. iv. 1870, pp. 256–258.
- STIEDA, L. Studien über das centrale Nervensystem der Wirbelthiere. Zeitschr. wiss. Zool. xxi. 1870, pp. 273–456, Taf. 17–20.

GENERAL NOTES AND FAUNÆ.

Dr. GÜNTHER puts the total number of fishes known at present as about 9000, and states that the collection of the British Museum contains at the present time altogether 5177 species, represented by 29,275 examples. Fish. viii. Preface.

Belgium. "Les Poissons des Côtes de Belgique, leurs parasites et leurs commensaux," par P. J. VAN BENEDEN. Mém. Ac. Belg. xxxviii. 1870, pp. 100, with 8 plates, representing chiefly parasites and commensals. This memoir contains a list of the marine fishes of Belgium, with notes on their occurrence and food. The parasites and commensals are enumerated with each species.

Germany and Switzerland. "Die Fische Deutschlands und der Schweiz," von J. C. WEBER. Zweite Auflage. München, 1870, 16mo, pp. 61, with 67 coloured plates. This little work is very useful to travellers in Germany and Switzerland, as it enables them to identify with the greatest possible ease the various kinds of fishes of those countries. Although the figures are of small size, most of them are accurate. The text has no scientific claim, and mentions chiefly the locality, food, and size of the several species.

Venice. Dr. A. NINNI gives a list of 258 species of fishes inhabiting the lagoons and bay of Venice; he adds notes on their vernacular names, occurrence, and economic value. Ann. Soc. Nat. Modena, v. 1870, pp. 63-88.

Mediterranean. A. CARUCCIO has given a list of 135 fishes collected in fresh waters and on the coasts of Sardinia and Sicily. Att. Soc. Ital. Sc. Nat. xii. 1870, pp. 567-586. Nothing new.

Algeria. "Liste des Poissons que l'on rencontre le plus souvent au marché d'Alger, ou Guide à la Pêcherie. Opuscule destiné à faire surtout connaître les espèces les meilleures pour la table, leur apprêt culinaire," &c., par le Dr. A. BOURJOT. (Extrait du Bull. Soc. Climatol. d'Alger.) Alger, 1870, 8vo, pp. 132. A publication written rather for practical purposes than for the advancement of science.

New Jersey. In "Notes on Freshwater Fishes of New Jersey" Dr. C. C. ABBOTT gives observations applying to the fishes of these waters as a class, rather than to any single species. Notes on habits of some of the more interesting kinds are added. Amer. Nat. 1870, iv. pp. 99-117, with woodcuts.—Observations on "Mud-loving fishes," as *Umbra lima* &c., by the same author, ibid. pp. 385-391.

Massachusetts. "The habits and migrations of some of the marine fishes of Massachusetts," by J. H. BLAKE, Amer. Nat. 1870, iv. pp. 513-521. These notes are on the Mackerel, Cod, Haddock, Temnodon, Herring, and Scombresox.

Yantsekiang. Dr. BLEEKER describes or indicates several new

fishes from this river, *Versl. & Meded. Ak. Amsterd.* iv. 1870, pp. 249–258.

Upper Amazon. Mr. GILL describes 10 new species from the Upper Amazon and Napo rivers. *P. Ac. Philad.* 1870, pp. 92–96.

Southern Brazil. Dr. HENSEL has concluded the account of the freshwater fishes collected by him (see *Zool. Record*, v. p. 141), *Wieg. Arch.* 1870, pp. 50–91. The total number is 53, 23 of which are described as new.

Palestine. In an article, "The Fishes of the Holy Land" (*Student & Intell. Observ.* 1869, pp. 409–417), Dr. GÜNTHER gives a list of 18 species. He states that Syria forms the centre of the faunæ of several regions, and that the proportions of the Syrian, European, African, and Indian types may be expressed by the numbers 5 : 5 : 4 : 3.

Nile. In an appendix to 'Travels in Central Africa and Explorations of the Western Nile Tributaries,' by Mr. and Mrs. PETHERICK, London, 1869, 8vo, Dr. GÜNTHER gives an account of "The Fishes of the Nile," vol. ii. pp. 195–268, with three plates and several woodcuts. He gives a sketch of the preceding literature on the subject, and shows that out of 55 species found in the Upper Nile not less than 24 are identical with West African species (see *Zool. Record*, iv. p. 156). The total number of fishes from the Upper and Lower Nile known at present is 80*; they are described, and some of them figured.

Red Sea. "Synopsis der Fische des Rothen Meeres," by C. B. KLUNZINGER. Part I. Percoiden—Mugiloiden. *Verh. z.-b. Ges. Wien*, 1870, pp. 669–834. The author has commenced to publish the results of ichthyological researches made during a sojourn of four years on the Red Sea. He gives excellent descriptions of all the species inhabiting the Red Sea; and his determinations and corrections of the synonymy are all the more reliable as he has examined most of the typical specimens in Continental collections. The results of conscientious and careful work, like that of Dr. Klunzinger, consist less in adding a number of ephemeral species to the systematic list, than in a more accurate definition of the characters of known species and genera. In the present paper the author carries his subject down to the Atherines; and we hope that he will soon continue this most valuable contribution.

Senegal. Dr. STEINDACHNER describes the fishes collected by him on this river during a visit of two months. *SB. Ak. Wien*, 1869, lx. pp. 669–714, with 12 plates, pp. 945–995, with 8 plates; 1870, lxi. pp. 533–583, with 8 plates. They are 94 in number, including marine species ascending into brackish water. Forty-four are limited to fresh water; and out of this number 21 are

* Not 81, there being only one species of *Polypterus*.

also found in the Nile. Therefore the author confirms the conclusion regarding the affinity of the fish-faunas of these rivers, which had been arrived at by the Recorder several years ago. The paper is illustrated by a number of very well executed plates.

Singapore. Dr. STEINDACHNER reports on a collection containing 64 species. SB. Ak. Wien, lx. 1870, pp. 557-571.

Burmah. Mr. DAY describes 5 new or imperfectly known species from Burmah, P. Z. S. 1870, pp. 99-101 (see Zool. Record, vi. p. 128).

Andaman Islands. Mr. DAY has collected, during a stay of about four weeks, 255 species of fishes, P. Z. S. 1870, pp. 677-705. Those described as new will be mentioned subsequently.

PALÆICHTHYES.

GANOIDEI.

Mr. KREFFT has made the most important discovery that a representative of *Ceratodus*, a ganoid genus hitherto believed to be extinct, is still living in rivers of Queensland. A comparison of the teeth with those of the fossil *C. runcinatus* proved the generic identity. Günther, Fish. viii. p. 323.

Mr. KREFFT has given an account of its external characters in P. Z. S. 1870, pp. 221-224 (with woodcuts), in a paper entitled "Description of a gigantic Amphibian allied to the genus *Lepidosiren*, from the Wide-Bay district, Queensland." The species is named *C. forsteri*. [On its anatomy and place in the system, see Ann. & Mag. Nat. Hist. 1871, and Proc. Roy. Soc. 16 March, 1871, p. 377.]

Acipenser. Dr. Günther describes 19 apparently well-established species (Fish. viii. pp. 333-344), and mentions the names of 10 others; he regards *A. liopeltis* as a new species from the Mississippi (p. 341).

Prof. A. Duméril (Ichth. génér. ii. pp. 90-268) adopts 6 subgenera [see Zool. Record, v. p. 170], and describes 6 European and 37 North-American species of *Huso*, 6 species of *Acipenser*, 8 European and 14 North-American species of *Antaceus*, 7 species of *Sterletus*, 1 of *Lioniscus*, and 1 of *Helops*; altogether 80 species, the majority of which are named by the author! The heads of several are figured on pls. 15-20.

Polyodon gladius figured by Duméril, Ichth. génér. ii. pl. 19. fig. 3.

Polypterus. Dr. Günther states that there is only one species of *Polypterus* (*bichir*), Fish. viii. p. 326.—Prof. Duméril acknowledges 4 species, Ichth. génér. ii. p. 391, pl. 23.

Prof. Traquair has worked out the cranial osteology of *Polypterus*, Journ. Anat. & Physiol. v. 1870, pp. 166-183, pl. 6.

Calamoichthys calabaricus. Described by Traquair, J. Dubl. Geol. Soc. 1870, June 8; figured by Duméril, Ichth. génér. ii. pl. 24.

Lepidosteus. Dr. Günther recognizes only 3, or perhaps 4 species. Fish. viii. pp. 328-331.—Prof. A. Duméril regards these species as generic types,

and describes (Ichth. génér. ii. pp. 322-369) 17 species of *Lepidosteus*, 8 of *Cylindrosteus*, and 5 of *Atractosteus*: altogether 30 species, the majority of which are named by the author! The heads of several are figured on pls. 21 & 22.

Amia. Dr. Günther states that there is only one species of *Amia* (*calva*), Fish. viii. p. 325.—Prof. Duméril describes 11 species, adding 2 to those previously named, Ichth. génér. ii. pp. 416-426, pl. 25 (head &c.).

HOLOCEPHALA.

Callorhynchus. There is only one species known at present, *C. peronii* (A. Dum.) being founded on young examples. Günther, Fish. viii. p. 351.

Chimæra monstrosa. Note on the brain by Miklucho-Maclay, Jena. Zeitschr. v. 1870, p. 132.

PLAGIOSTOMATA.

GEGENBAUR, C. Ueber das Skelett der Gliedmaassen der Wirbelthiere im Allgemeinen und der Hintergliedmaassen der Selachier insbesondere. Jena. Zeitschr. v. 1870, pp. 397-447, tabb. 15 & 16, and woodcuts. [On the Skeleton of the limbs of Vertebrates generally, and of the hind limbs of Selachians especially.]

——. Ueber die Modificationen des Skelets der Hindergliedmaassen bei den Männchen der Selachier und Chimæren. Ibid. pp. 448-458, with fig. [On the modifications of the Skeleton of the hind limbs in the males of Selachians and Chimæras.]

Dr. GÜNTHER has adopted the following arrangement (Fish. viii. p. 353):—

First suborder SELACHOIDEI.

Fam. I. CARCHARIIDÆ.

Group A. CARCHARINA.

1. *Carcharias* (Cuv.), with 46 species, two of which are new, viz. *C. (Hypoprion) playfairii*, from Zanzibar, p. 382; and *C. (Prionodon) brachyurus*, from New Zealand.
2. *Hemigaleus* (Blkr.), with 2 species.
3. *Loxodon* (M. & H.), with 1 species.
4. *Galeocерdo* (M. & H.), with 3 species.
5. *Thalassorhinus* (M. & H.), with 2 species.
6. *Galeus* (Cuv.), with 2 species.

Group B. ZYGÆNINA.

7. *Zygæna* (Cuv.), with 5 species.

Group C. MUSTELINA.

8. *Trienodon* (Gthr.), with 1 species.
9. *Leptocarcharias* (Gthr.), with 1 species.
10. *Triacis* (M. & H.), with 3 species.
11. *Mustelus* (Cuv.), with 8 species, one of which is new, *M. antarcticus*, p. 387.

Fam. 2. LAMNIDÆ.

Group A. LAMNINA.

- 12. *Lamna* (Cuv.), with 3 species.
- 13. *Carcharodon* (M. & H.), with 1 species.
- 14. *Odontaspis* (Agass.), with 2 species.
- 15. *Alopias* (M. & H.), with 1 species.

Group B. SELACHINA.

- 16. *Selache* (Cuv.), with 1 species.
- Incertæ sedis, *Pseudotriakis microdon* (Capello).

Fam. 3. RHINODONTIDÆ.

- 18. *Rhinodon typicus* (Smith).

Fam. 4. NOTIDANIDÆ.

- 19. *Notidanus*, with 4 species.

Fam. 5. SCYLLIIDÆ.

- 20. *Scyllium* (M. & H.), with 11 species.
- 21. *Pristiurus* (Bonap.), with 1 species.
- 22. *Ginglymostoma* (M. & H.), with 4 species.
- 23. *Stegostoma* (M. & H.), with 1 species.
- 24. *Parascyllium* (Gill), with 1 species.
- 25. *Chiloscyllium* (Gthr.), with 4 species.
- 26. *Crossorhinus* (M. & H.), with 3 species.

Fam. 6. CESTRACIONIDÆ.

- 27. *Centracion* (Cuv.), with 4 species, one of which is new (*C. galeatus*), from Australia, p. 416.

Fam. 7. SPINACIDÆ.

- 28. *Centrina* (Cuv.), with 1 species.
- 29. *Acanthias* (M. & H.), with 3 species.
- 30. *Centrophorus* (M. & H.), with 9 species.
- 31. *Spinax* (M. & H.), with 2 species.
- 32. *Centroscyllium* (M. & H.), with 1 species.
- 33. *Scymnus* (Gthr.), with 1 species.
- 34. *Lamargus* (Gthr.), with 2 species.
- 35. *Euprotomicrus* (Gill), with 1 species.
- 36. *Echinorhinus* (Blainv.), with 1 species.
- 37. *Isistius* (Gill), with 1 species.

Fam. 8. RHINIDÆ.

- 38. *Rhina squatina* (L.).

Fam. 9. PRISTOPHORIDÆ.

- 39. *Pristiophorus* (M. & H.), with 4 species, three of which are new, viz. *P. nudipinnis*, from Tasmania, p. 432; *P. owenii*, hab. — ? , p. 432; and *P. japonicus*, p. 433.

Second suborder BATOIDEI.

Fam. 1. PRISTIDÆ.

- 1. *Pristis* (Lath.), with 5 species.

Fam. 2. RHINOBATIDÆ.

- 2. *Rhynchobatus* (Gthr.), with 2 species.

3. *Rhinobatus* (Gthr.), with 18 species, one being new, *Rh. spinosus*, from Mexico, p. 518.
4. *Trygonorhina* (M. & H.), with 1 species.

Fam. 3. TORPEDINIDÆ.

5. *Torpedo* (Dum.), with 9 species, one being new, *T. smithii*, from South Africa (?), p. 451.
6. *Narcine* (Henle), with 5 species.
7. *Hypnos* (Dum.), with 1 species.
8. *Discopyge* (Tschudi), with 1 species.
9. *Astrape* (M. & H.), with 2 species.
10. *Temera* (Gray), with 1 species.

Fam. 4. RAJIDÆ.

11. *Raja* (Cuv.), with 40 species.
12. *Psammobatis rudis* (gen. et sp. nov.), from Magellan Straits, p. 470.
13. *Sympterygia* (M. & H.), with 1 species.
14. *Platyrrhina* (M. & H.), with 2 species.

Fam. 5. TRYGONIDÆ.

15. *Urogymnus* (M. & H.), with 1 species.
16. *Ellipesus* (Schomb.), with 1 species.
17. *Trygon* (Adanson), with 29 species. New are:—*T. punctata*, from the East Indies (?), p. 474; *T. nuda*, from India, p. 476; *T. margarita* and *rudis*, from West Africa, p. 479.
18. *Taniura* (M. & H.), with 9 species.
19. *Urolophus* (M. & H.), with 5 species.
20. *Pteroplatea* (M. & H.), with 7 species.

Fam. 6. MYLIOBATIDÆ.

Group A. MYLIOBATINA.

21. *Myliobatis* (Cuv.), with 10 species, one being new, *M. cornuta*, from Japan, p. 490.
22. *Ætobatis* (M. & H.), with 1 species.
23. *Rhinoptera* (Kuhl), with 8 species, one being new, *Rh. polyodon*, hab. — ?, p. 495.

Group B. CERATOPTERINA.

24. *Dicerobatis* (Blainv.), with 5 species.
25. *Ceratoptera* (M. & H.), with 2 species.

Selache maxima. Th. Cornish describes a Shark apparently of this species, captured on the coast of Cornwall. Zoologist, 1870, pp. 2253-2260.

Spinax acanthias. Embryo figured by Van Beneden in Mém. Ac. Belg. xxxviii. 1870, pl. 7.

Pristis. Prof. Kölliker and Dr. Günther have determined the singular body described by Dr. Gray under the name of *Myriosteon higginsii* as one of the hollow tubes of the saw of *Pristis*. Gray, Ann. & Mag. 1870, v. p. 366. As these tubes are homologous with the rostral processes of the Rays generally, Mr. Carter is quite right in stating that he had extracted a *Myriosteon* from the snout of a Ray. Ibid. p. 449.

Torpedo narke. On the final distribution of the nerves in the electric organ, by G. V. Ciaccio, Arch. per la Zool. Anat. e Fisiol. 1870, ii. pp. 5-9.

Cephaloptera. A. Dumeril has noticed the præbranchial appendages de-

scribed by Panceri in this genus. Compt. Rend. 1870, lxx. pp. 491, 492; or Ann. & Mag. 1870, v. p. 385.

TELEOSTEI.

ACANTHOPTERYGII.

Dr. KLUNZINGER proposes the following arrangement of the first portion of the Acanthopterygians (Verh. z.-b. Ges. Wien, 1870, pp. 673 *et seqq.*)—:

Fam. I. PERCOIDEI (= *Percidæ*, Gthr., exc. *Ambassis*).

Group A. *Serranini* (Gthr.).

B. *Priacanthini* (Gthr.).

C. *Apogonini* (Gthr., exc. *Ambassis*).

Fam. II. AMBASOIDEI (= *Bogodoidei*, Blkr.).

Fam. III. BEEYCOIDEI (Lowe).

Fam. IV. THERAPONOIDEI (Klzt.), with *Therapon* and *Dules*.

Fam. V. PRISTIPOMATOIDEI (Klzt.), with *Pristipoma*, *Diagramma*, and *Scolopsis*.

Fam. VI. SCIÆNOIDEI (Gthr.).

Fam. VII. MULLOIDEI (Gray).

Fam. VIII. SPAROIDEI (Cuv.).

Group A. *Sargina* (Gthr.).

B. *Pagrina* (Gthr., with *Dentex* and *Synagris*).

Fam. VIII a. APHAREOIDEI (Klzt.), with *Aphareus*.

Fam. VIII b. CÆSIONOIDEI (Klzt.), with *Cæcio*.

Fam. VIII c. MÆNOIDEI (Klzt.), with *Mæna* and *Gerres*.

Fam. IX. CHÆTODONTOIDEI (= *Chatodontina*, Gthr.).

Fam. IX a. PSETTOIDEI (Blkr.).

Fam. IX b. PIMELOPTEROIDEI (Blkr.).

Fam. X. CIRRHITOIDEI (Gray).

Fam. XI. CATAPHEACTI (Cuv.).

Group A. *Scorpenini* (Gthr.).

B. *Cottini* (Gthr.).

Fam. XII. URANOSCOPOIDEI (Rich.).

Fam. XIII. POLYNEMOIDEI (Gthr.).

Fam. XIV. SPHYRÆNOIDEI (Gthr.).

Fam. XV. MUGILOIDEI (Cuv.).

Group A. *Mugilini* (= *Mugilidæ*, Gthr.).

B. *Atherinini* (= *Atherinidæ*, Gthr.).

PERCIDÆ.

Labrax punctatus occurs in Senegambia, Steindachner, SB. Ak. Wien, 1869, lx. p. 671.

Lates niloticus figured by Steindachner, l. c. p. 672, taf. 1.

Lates calcarifer occurs in Queensland; has very small pseudobranchiæ. Günther, P. Z. S. 1870, p. 824.

Centropristes subligarius is described as a new species from Pensacola, by Cope, P. Ac. Philad. 1870, p. 120.

Serranus. Dr. Bleeker's 22nd part of the 'Atlas Ichthyologique,' which contains figures of the East-Indian species, has been noticed above, p. 82.

✓ Dr. Klunzinger describes the species found in the *Red Sea*; he has also examined their synonymy. He distinguishes as a distinct genus (*Pseudoseranus*) species with lateral canine teeth in the lower jaw, as *S. louti*, *cabrilla*, &c. Verh. z.-b. Ges. Wien, 1870, pp. 674-689.

Serranus varius, *Serranus courtadei*, and *Serranus quinquefasciatus* are described as new Central-American species by Bocourt, Ann. Sc. Nat. 1870 (1869), pp. 222, 223. *Serranus acanthophorus* (described as another new species, *ibid.*) is, according to a MS. note of the author, = *S. maculato-fasciatus* (Steind.).

Serranus glaucus and *Serranus homfrayi*, spp. nn., Day, P. Z. S. 1870, p. 678, Andaman Islands.

Anthias. Dr. Bleeker's 22nd part of the 'Atlas Ichthyologique,' which contains figures of the East-Indian species, has been noticed above, p. 82.

Genyorogete grammica, sp. n., Day, l. c. p. 679, Andaman Islands.

Mesoprion. Dr. Klunzinger describes the species found in the *Red Sea* (including *Genyorogete*). L. c. pp. 690-703.

Mesoprion multidens, sp. n., Day, l. c. p. 680, Andaman Islands.

Mesoprion pacificus is described as a new species from Guatemala by Bocourt, Ann. Sc. Nat. 1870 (1869), p. 223.

Apogon. Dr. Klunzinger describes the species found in the *Red Sea*. L. c. pp. 709-716.

Ambassis denticulata, sp. n., Klunzinger, l. c. p. 719, Red Sea.

Ambassis thomassi, sp. n., Day, l. c. p. 369, Calicut and Mangalore.—*Ambassis macracanthus* (Blkr.) described by Day from the Andaman Islands, *ibid.* p. 681.

PRISTIPOMATIDÆ.

Pristipoma. Dr. Steindachner (SB. Ak. Wien, 1869, lx.) has described the following species from Senegambia:—*P. jubelini*, p. 675, taf. 2; *P. peroteti*, p. 678, taf. 3; *P. rogeri*, p. 680, taf. 4; *P. nullum*=*rangii*, p. 682, taf. 5. He refers also *Larimus auritus* to this genus.

Diagramma. Dr. Klunzinger describes the species inhabiting the Red Sea, which he reduces in number; he regards as new *Diagramma sordidum* and *umbrinum*. Verh. z.-b. Ges. Wien, 1870, pp. 734-738.

✓ *Dentex*. Dr. Klunzinger (l. c. pp. 762-765) subdivides this genus into:—1. *Dentex* (*D. vulgaris*); 2. *Polysteganus* (subg. n., *Polysteganus cæruleopunctatus*, sp. n., p. 763, and *Dentex nufar*=*Dentex variabilis*); 3. *Gymno-cranius* (subg. n., *D. rivulatus*).

Synagris notatus, sp. n., Day, P. Z. S. 1870, p. 684, Andaman Islands.

Cæcio. On the species inhabiting the Red Sea see Klunzinger, l. c. pp. 768-770.

SQUAMIPINNES.

Chætodon. Dr. Klunzinger describes the species from the *Red Sea*. Verh. z.-b. Ges. Wien, 1870, pp. 774-783.

Holacanthus. Dr. Klunzinger recognizes only four species as inhabiting the *Red Sea*. L. c. pp. 785-790.

Tholichthys (Gthr.) may be a young *Chætodon* or *Holacanthus*, Day, P. Z. S. 1870, p. 687.

MULLIDÆ.

Dr. KLUNZINGER describes the species inhabiting the *Red Sea*. Verh. z.-b. Ges. Wien, 1870, pp. 741-747.

Mulloides pinnivittatus, sp. n., Steindachner, SB. Ak. Wien, lxi. 1870, p. 624, Nagasaki.

Upeneus atrocingulatus, sp. n., Kner, SB. Ak. Wien, 1870, lxi. p. 443, Savay [described by Günther as *U. trifasciatus*, var., Fish. i. p. 408].

SPARIDÆ.

Lethrinus. *Dr. Klunzinger* describes the species inhabiting the *Red Sea*. Verh. z.-b. Ges. Wien, 1870, pp. 750-756. *Lethrinus xanthochilus* is a new species, p. 753. He is quite right in stating that *L. mahsenoides* (C. & V.) is not the fish described under the same name by Bleeker, but is *L. abbreviatus* of Peters. The Recorder considers *L. rostratus* (C. & V.) and *L. longirostris* to be very distinct species.

Pagrus megalommatatus, sp. n., Klunzinger, l. c. p. 762, Red Sea.

Pagrus chinensis, sp. n., and *P. unicolor*?, Steindachner, SB. Ak. Wien, lxi. 1870, p. 625, China.

CIRRHITIDÆ.

Cirrhitus gibbosus is described as a new species from Macao by Guichenot, Nouv. Arch. Mus. v. p. 199, pl. 12. fig. 2.

SCORPÆNIDÆ.

Scorpena. *Dr. Klunzinger* describes the species inhabiting the *Red Sea*. Verh. z.-b. Ges. Wien, 1870, pp. 790-805; as new *Scorpena tristis*, p. 802.

Pterois miles = *Pt. volitans*, Klunzinger, l. c. p. 807.

Micropus. This genus [described by Kröyer as *Caracanthus*, by Bleeker as *Amphiprionichthys*, by Kner as *Centropus*] has received a fifth name from Guichenot, who describes a *Crossoderma madagascariense* (g. et sp. n.), Nouv. Arch. Mus. v. p. 194, pl. 12. fig. 1.

BERYCIDÆ.

Holocentrum. *Dr. Klunzinger* (Verh. z.-b. Ges. Wien, 1870, pp. 720-726) describes the species inhabiting the *Red Sea*; *H. platyrrhinum*, described as new (p. 725), is evidently based on young examples of one of the new species.

Holocentrum andamanense, sp. n., Day, P. Z. S. 1870, p. 686.

Myripristis bodje (Blkr.) = *M. murdjan*. Klunzinger, l. c. p. 726.

KURTIDÆ.

Parapriacanthus, g. n., Steindachner, SB. Ak. Wien, 1870, lxi. p. 623. *P. ransonneti*, sp. n., from Nagasaki.—D. 5/9. A. 3/19. V. 1/5. L. lat. 70.

POLYNEMIDÆ.

Polynemus quadrifilis figured by Steindachner, SB. Ak. Wien, 1869, lx. p. 698, taf. 10.

Galeoides polydactylus figured by Steindachner, l. c. p. 701, taf. 11.

SCIÆNIDÆ.

Larimus auritus. *Pristipoma macrophthalmmum* (Blkr.) is this species. Steindachner, SB. Ak. Wien, 1869, lx. p. 684.

Sciæna epipercus (Blkr.) described by Steindachner, l. c. p. 695, taf. 9.

Sciæna adusta described by Hensel, Wieg. Arch. 1870, p. 50.

Otolithus senegalensis (C. & V.) = *Pseudotolithus typus* (Blkr.). Steindachner, l. c. p. 687, taf. 6.

Otolithus macragnathus (Blkr.) figured by Steindachner, l. c. p. 690, taf. 7.

Corvina nigrita (C. & V.) = *clavigera* (C. & V.) [as already suggested by Dr. Günther]. Steindachner, l. c. p. 692, taf. 8.

XIPHIIDÆ.

Histiophorus. F. J. Knox publishes notes on a Swordfish stranded on the west coast of the North Island of New Zealand, and figures the skull &c. Tr. N. Z. Inst. ii. 1870, pp. 13-16, pl. 1. [This appears to be a specimen of *Histiophorus brevirostris*, Playf.]

CARANGIDÆ.

Caranx senegalus (C. & V.) described by Steindachner, SB. Ak. Wiss. Wien, 1869, lx. p. 704.

Caranx compressus, sp. n., Day, P. Z. S. 1870, p. 689, Andaman Islands.

Argyrius setipinnis. From notes made by Dr. Steindachner, l. c. p. 706, it would appear that *Vomer goreensis* (Guich.) = *V. senegalensis* (Guich.) = *A. setipinnis*, var. B (Gthr.) [= *V. dorsalis*, Gill], and that *V. gabonensis* (Guich.) = *A. setipinnis*, var. A (Gthr.) = *A. gabonensis* (Steind.).

Vomer curtus is described as a new species from Newport, R. I., by Cope, P. Ac. Philad. 1870, p. 119.

Trachymotus. Dr. Steindachner (l. c.) describes the following species from Senegambia:—*T. goreensis* (C. & V.) = *T. myrias* (C. & V.) = *T. maxillosus* (C. & V.), p. 707; *T. ovatus*, p. 709; *T. teraioides* (Dum.), p. 710, taf. 12; *T. martini*, sp. n., p. 711.

NOMEIDÆ.

Cubiceps indicus, sp. n., Day, P. Z. S. 1870, p. 690, Madras.

SCOMBRIDÆ.

Scomber reani, sp. n., Day, P. Z. S. 1870, p. 690, Andaman Islands.

Echeneis feeds on fishes. Van Beneden, Bull. Ac. Belg. 1870, xxx. pp. 181-185.

TRACHINIDÆ.

Pseudochromis ransonneti, sp. n., Steindachner, SB. Ak. Wien, lx. 1870, p. 562, Singapore.

BATRACHIDÆ.

Batrachus grunniens, an *reticulatus* (sp. n.)? Steindachner, SB. Ak. Wien, lx. 1870, p. 564, Singapore.

COTTIDÆ.

Centridermichthys japonicus, sp. n., Steindachner, SB. Ak. Wien, 1870, lxi. p. 625, taf. 1. fig. 3.

Platycephalus nematophthalmus from Singapore. Steindachner, *l. c.* lx. p. 561.
Platycephalus longiceps = *Pl. tentaculatus*, Klunzinger, Verh. z.-b. Ges. Wien, 1870, p. 813.

CATAPHRACTI.

[*Agonus*] *Paragonus sturioides*, g. et sp. n., Guichenot, Nouv. Arch. Mus. v. p. 202, pl. 12. fig. 3, China.

GOBIIDÆ.

Gobius buccichi, sp. n., Steindachner, SB. Ak. Wien, 1870, lxi. p. 627, taf. 2. fig. 4, Lesina (Dalmatia).

Gobius ornatus, *Gobius andamanensis*, and *Gobius stoliczkae*, spp. nn., Day, P. Z. S. 1870, pp. 691, 692, from the Andaman Islands.

Euctenogobius andamanensis, sp. n., Day, *l. c.* p. 693.

Apocryptes cantor, sp. n., Day, *l. c.* p. 693, Andaman Islands.

Periophthalmus koelreuteri. West-African specimens, as those named *P. gabonicus* and *P. erythronemus* by Duméril and Guichenot, are not specifically distinct [as already stated by Günther]. Steindachner, *l. c.* 1869, lx. p. 945.

Eleotris. Dr. Steindachner (*l. c.*) describes as new Senegambian species:—*E. lebretonis*, p. 947, taf. 1. figs. 3, 4; *E. (Cuius) senegalensis*, p. 949, taf. 2. figs. 1, 2; and *E. (Cuius) daganensis*, p. 951, taf. 2. figs. 3–5.

Eleotris scintillans (Blyth) redescribed by Day, *l. c.* p. 693.

BLENNIIDÆ.

Blennius vulgaris. Lunel shows that the *Bl. alpestris* of Blanchard, from Lake Bourget in Savoy, is nothing but this species. Rev. et Mag. Zool. 1870, pp. 3–14, pl. 1.

Sticheopsis, g. n., Kner, SB. Ak. Wien, lxi. 1870, p. 441. Scales none; jaws even, with bands of fine pointed teeth; palate toothless; dorsal fin composed of spines only; vertical fins united; ventrals 5–5, jugular; pectorals long. Lateral line incomplete. *Sticheopsis nana*, sp. n., Kner, *l. c.* from Decastria Bay.—D. 46. A. 20–21.

MASTACEMBELIDÆ.

Rhynchobdella sinensis, sp. n., Bleeker, Versl. & Meded. Ak. Amsterd. iv. 1870, p. 249, with figure.—D. 34/72. A. 3/66.

SPHYRENIDÆ.

Sphyræna obtusata = *Sph. flavicauda*, Klunzinger, Verh. z.-b. Ges. Wien, 1870, p. 820; *Sph. agam* = *Sph. affinis*, *id. ibid.* p. 822; *Sphyræna genie*, sp. n., *id. ibid.* p. 823, Red Sea.

ATHERINIDÆ.

Atherina pinguis = *A. forskalii*, Klunzinger, *l. c.* p. 833.

Atherina cylindrica, sp. n., Klunzinger, *l. c.* p. 834, Red Sea.

MUGILIDÆ.

Mugil. Dr. Klunzinger describes the species found in the Red Sea, Verh. z.-b. Ges. Wien, 1870, pp. 824–831.

Mugil. Dr. Steindachner (SB. Ak. Wien, 1869, lx.) describes the following species from Senegambia:—*M. ashantensis* (Blkr.), p. 953; *M. falcipinnis*

(C. & V.), p. 955; *M. grandisquamis* (C. & V.), p. 957; *M. dumerilii* (sp. n.), p. 959.

Myxus superficialis and *Myxus trimaculatus*, spp. nn., Klunzinger, l. c. pp. 831, 832, from the Red Sea.

GASTEROSTEIDÆ.

Gasterosteus sinensis, sp. n., Guichenot, Nouv. Arch. Mus. v. p. 204, pl. 12. fig. 4, China.—Dorsal spines seven.

GOBIESOCIDÆ.

Gobiosox strumosus, sp. n., Cope, P. Ac. Philad. 1870, p. 121, S. Carolina.

OPHIOCEPHALIDÆ.

Ophiocephalus obscurus figured by Günther in Petherick's Travels in C. Africa, ii. pl. 2. fig. B.

Ophiocephalus aurolineatus, sp. n., Day, P. Z. S. 1870, p. 99, Moulmein.

LABYRINTHICI.

Osphromenus olfax. A complete account of its natural history by P. Dabry, Bull. Acclim. 1870, pp. 671-688.—Notes on this fish with respect to its acclimatization in Europe by Senoner, Zool. Gart. 1870, pp. 295-297.

Macropus. Carbonnier has continued his observations on specimens bred by him in Paris (see Zool. Record, vi. p. 133). Bull. Acclim. 1870, pp. 26-32, with figure.

Ctenopoma petherici figured by Günther in Petherick's Travels in C. Africa, ii. pl. 1. fig. A.

INCERTÆ SEDIS.

Krohninus filamentosus (Cocco). Costa describes and figures a fresh example; he thinks that it is the undeveloped state of some other fish, but not of *Trachypterus*. Annuar. Mus. Nap. v. 1869, pp. 41-43, tav. 1. fig. 1.

ACANTHOPTERYGII PHARYNGOGNATHI.

Amphiprion tricolor = *A. ephippium*, Day, P. Z. S. 1870, p. 695.

Labrichthys bicolor, sp. n., Day, l. c. p. 696, Andaman Islands.

PlatyGLOSSUS ransonneti and *PlatyGLOSSUS dayi*, spp. nn., Steindachner, SB. Ak. Wien, lx. 1870, p. 657, Singapore.

Cheilinus. *Cossyphus echis* (sp. n., Guichenot, Nouv. Arch. Mus. v. p. 197, pl. 12. fig. 5, from Madagascar) appears to be the young of a species of this genus.

Epibulus striatus, sp. n., Day, l. c. p. 697, Andaman Islands.

Gerres melanopterus (Blkr.) = *G. octatis* (Blkr.). Steindachner, SB. Ak. Wien, 1869, lx. p. 961.

Gerres singaporensis, sp. n., Steindachner, l. c. p. 568.

Chromis. Dr. Steindachner reduces all the various forms of this genus (*Sarotherodon* included) to two species, viz. *Chr. niloticus* and *mossambicus*. L. c. pp. 963-970, taf. 4.

Hemichromis bimaculatus (Gill) = *H. auritus* (Gill) = *H. guttatus* (Gthr.), according to Steindachner, l. c. p. 972.

Hemichromis sacer figured by Günther, Student & Intell. Observ. 1869, p. 416.

Acara portalegrensis and *Acara minuta*, spp. nn., Hensel, Wieg. Arch. 1870, pp. 52, 53, from Porto Alegre.

Heros acaroides, sp. n., Hensel, l. c. p. 54, from Porto Alegre.

Geophagus and *Satanoperca*. Dr. Hensel is inclined to unite these genera, Wieg. Arch. 1870, p. 60.—He describes the following new species from Southern Brazil:—*Geophagus rhabdotus*, p. 60, *Geophagus gymnogenys*, p. 61, *Geophagus bucephalus*, p. 63, *Geophagus labiatus*, p. 64, *Geophagus scymnophilus*, p. 65, and *Geophagus pygmaeus*, p. 68.—The author has observed that these fishes take care of their progeny.

Crenicichla lepidota (Heck.). Hensel is inclined to regard this form as specifically distinct from *Cr. saxatilis*. L. c. p. 55.

Crenicichla punctata and *Crenicichla polysticta*, spp. nn., Hensel, l. c. pp. 57, 58, from Rio Grande do Sul.

ANACANTHINI.

Dr. BLEEKER's 22nd and 23rd parts of the 'Atlas Ichthyologique,' which contain the text of the description of the East-Indian species of *Pleuronectidæ*, have been noticed above, p. 82.

Gadus. Kner & Steindachner (SB. Ak. Wien, 1870, lxi.) describe three species from Decastria Bay, viz. *Gadus navaga* (Koelr.), p. 439, *Gadus macrophthalmus* (Tiles.), p. 440, *Boreogadus productus* (Ayres), p. 440.

Gadus morrhua. A case of true hermaphroditism described by J. A. Smith, Journ. Anat. & Physiol. iv. 1870, p. 256.

Pleuronectes. Kner & Steindachner (SB. Ak. Wien, 1870, lxi.) describe three species from Decastria Bay, viz. *Pl. stellatus* (Pall.), p. 421, *Pl. pinifasciatus* (sp. n.), p. 422, taf. 1. fig. 1, and *Pl. asper* (Pall.), p. 425.

Pleuronectes scutifer, sp. n., Steindachner, SB. Ak. Wien, lxi. 1870, p. 628, taf. 2, Tchifoo.—D. 69. A. 50.

Solea nigrostriolata, sp. n., Kner & Steindachner, l. c. p. 427, taf. 1. fig. 2, Viti-Levu.

[*Synaptura*] *Brachirus sundaicus*, sp. n., Bleeker, Atl. Ichth. Pleuron. p. 20, pl. 8. fig. 2.

Plagusia. Dr. Bleeker names the Indian species *Paraplagusia* and *Rhinoplagusia*, l. c. p. 26.

Paraplagusia macrocephalus, sp. n., Bleeker, l. c. p. 28, pl. 15. fig. 3, Sumatra.

Cynoglossus brachycephalus, sp. n., Bleeker, l. c. p. 38, pl. 13. fig. 6, Sumatra.

PHYSOSTOMI.

SILURIDÆ.

Clarias senegalensis described by Steindachner, SB. Ak. Wien, 1869, lx. p. 978.

Clarias macracanthus figured by Günther, Stud. 1869, p. 414.

Heterobranchius senegalensis described by Steindachner, l. c. p. 980.

Schilbe senegalensis, C. & V., var. *fasciata*, an nov. spec.?, Steindachner, l. c. p. 983, taf. 6. figs. 1, 2.

Eutropius adansonii figured by Steindachner, *l. c.* p. 985, taf. 5.

Chrysichthys nigrodigitatus figured by Steindachner, *l. c.* p. 989, taf. 7. figs. 1-4.—The author states that *Chr. acutirostris* (Gthr.) is the adult state; [but the latter species being founded on a specimen 9½ inches long, and having been compared with a specimen of the true *Chr. nigrodigitatus* of twice the length, it is difficult to agree with Dr. Steindachner].

Chrysichthys furcatus figured by Steindachner, *l. c.* p. 992, taf. 8.

Hemibagrus macropterus, sp. n., Bleeker, Versl. & Meded. Ak. Amsterd. iv. 1870, p. 257, c. fig., Yantsekiang.

Auchenoglanis biscutatus figured by Steindachner, *l. c.* p. 993, taf. 6. figs. 3, 4.

Arius commersonii. Dr. Hensel has also in this species observed that the male hatches the eggs in its mouth. Wieg. Arch. 1870, p. 70.

Arius andamanensis, sp. n., Day, P. Z. S. 1870, p. 699.

Rhamdia dorsalis, sp. n., Gill, P. Ac. Philad. 1870, p. 94, Upper Amazon.

Gorubimichthys ortonii, sp. n., Gill, *l. c.*, Upper Amazon.

Sciades marmoratus, sp. n., Gill, *l. c.* p. 95, Upper Amazon.

Hara. Notes on this genus and its species by Surgeon Day, Journ. As. Soc. Beng. ii. 1870, pp. 37-40. Three species are figured, one, *Hara jerdoni*, being new, pl. 4. fig. 2, from the Sylhet district.

Cetopsis ventralis, sp. n., Gill, *l. c.* p. 95, Upper Amazon.

Centromochlus steindachneri, sp. n., Gill, *l. c.*, Upper Amazon.

Synodontis sorex figured by Günther in Petherick's Travels in C. Africa, ii. pl. 1. fig. B.

Callichthys paleatus. Notes by Hensel, Wieg. Archiv, 1870, p. 71.

Plecostomus spiniger, sp. n., Hensel, *l. c.* p. 73, Rio Cadea.

CYPRINIDÆ.

Cyprinus carpio. An example with deformed jaws described by A. L. Donnadieu. Compt. Rend. 1870, lxx. pp. 200, 201.

Cirrhitina macrops, sp. n., Steindachner, SB. Ak. Wien, lxi. 1870, p. 636, Madras.

Labeo senegalensis and *L. seltsi* figured by Steindachner, *l. c.* pp. 560, 562, taf. 6, 7, & 8.

Labeo stolizkae, sp. n., Steindachner, *l. c.* p. 634, Moulmein.

Labeo neilli, sp. n., Day, P. Z. S. 1870, p. 99, Burmah.—*Labeo nigrescens*, sp. n., Day, *l. c.* p. 371, Mangalore.

Discognathus lamta found in the neighbourhood of Aden by Playfair, P. Z. S. 1870, p. 85.—And in Abyssinia by Blanford, Observ. Geol. & Zool. Abyss. (see p. 3) p. 460.

Capoeta damascina figured by Günther, Student and Intell. Obs. 1869, p. 413.

Barbus albanicus, sp. n., Steindachner, *l. c.* p. 630, taf. 3. fig. 1, Lake of Scutari.

Barbus sclateri=*B. bocagei*, according to Steindachner, *l. c.* p. 631. [?]

Barbus multimaculatus, sp. n., Steindachner, *l. c.* p. 633, taf. 3. fig. 2, Cape of Good Hope.

Barbus chilinoides. Dr. Steindachner states that he has formerly confounded this fish with *Barbus mosal*. *l. c.* p. 634. [As the author omits to refer to the Catal. Fish. vii. p. 127, where this error has been corrected, we may as well take notice of it here.]

Barbus mosal and *B. tor* compared with each other by Day, *l. c.* p. 372.

Barbus amphibius (C. & V.) = *Systomus carnaticus* (Jerd.). Day, *l. c.* p. 373.

Barbus arulius (Jerd.) has two barbels. Day, *l. c.* p. 373.

Barbus (*Barbodes*) *stevensonii*, sp. n., Day, *l. c.* p. 100, Burmah.—*Barbus* (*Puntius*) *puntio* (H. B.) redescribed by Day, *l. c.* p. 100.—*Barbus* (*Barbodes*) *jerdoni* and *Barbus* (*Barbodes*) *pulchellus*, spp. nn., Day, *l. c.* p. 372, Mangalore.

Saurogobio and *Rhinogobio* are indicated as two new genera from the Yantsekiang by Bleeker, Versl. & Meded. Ak. Amsterd. iv. 1870, p. 253. They are allied to *Pseudogobio*; but the former has the dorsal fin entirely in the anterior half of the body, the caudal not included, and uniserial pharyngeal teeth. *Rhinogobio* has a long snout, small inferior mouth, &c. Species not described.

Rasbora trilineata, sp. n., Steindachner, SB. Ak. Wien, 1870, lxi. p. 637, taf. 3. fig. 3, Johore.

Semiplotus modestus, sp. n., Day, P. Z. S. 1870, p. 101, Burmah.

Leuciscus rutilus. "The Book of the Roach," by G. Fennell. Lond. 1870, 16mo, pp. 118. A little book written by an angler for anglers.

Rhodeus amarus. Further observations [see Zool. Record, vi. p. 136] on its reproduction by Noll, Zool. Gart. 1870, pp. 237, 238.

Acanthorhodeus is indicated as a new genus from the Yantsekiang by Bleeker, Versl. & Meded. Ak. Amsterd. iv. 1870, p. 253; it is allied to *Rhodeus*, but has a strong spine in the dorsal and anal fins. Species not described.

Danio. *Perilampus malabaricus* (Jerd.) is the male, and *Perilampus canarensis* (Jerd.) the female of the same species, which is identical with *D. micronema*, Blkr. [?]. Day, *l. c.* p. 374.

Barilius gatensis (C. & V.) = *B. rugosus* (Day), Günther, Fish. vii. 1868, p. 291; and Day, P. Z. S. 1870, p. 373.—*Opsarius canarensis* (Jerd.) is a *Barilius*, Day, *l. c.* p. 374.

Barilius senegalensis, sp. n., Steindachner, SB. Ak. Wien, 1870, lxi. p. 564, taf. 5. fig. 2.

Pseudobrama and *Luciobrama* are indicated as two new genera from the Yantsekiang by Bleeker, *l. c.* p. 253. They are allied to *Acanthobrama*, the former genus having uniserial pharyngeal teeth, but large scales and a short anal fin. *Luciobrama* is elongate, has small scales, and uniserial awl-shaped pharyngeal teeth. Species not described.

Chela johorensis, sp. n., Steindachner, *l. c.* p. 638, Johore River.

Nemachilus. *Platacanthus maculatus* (see Zool. Record, iv. p. 174) is considered to be the type of a genus, *Jerdonia*, by Mr. Day, P. Z. S. 1870, p. 700.

Nemachilus sinuatus, sp. n., Day, *l. c.* p. 371, Wynaad.

Botia modesta, figured by Bleeker, *l. c.* p. 254.

Botia elongata, sp. n., Bleeker, *l. c.* c. fig., Yantsekiang.

CHARACINIDÆ.

Curimatus voga, sp. n., Hensel, Wieg. Arch. 1870, p. 78, Rio dos Sinos.

Alestes macrolepidotus figured by Steindachner, SB. Ak. Wien, 1870, lxi. p. 540, taf. 1.

Alestes wytsi, sp. n., Steindachner, *l. c.* p. 542, taf. 2. fig. 1, Senegal.

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Alestes (Brachyalestes) senegalensis, sp. n., Steindachner, l. c. p. 545, taf. 2. fig. 2.

Tetragonopterus. Dr. Hensel (l. c.) describes *T. rutilus* (Jenyns?), p. 80, *T. microstoma* (Gthr.?), p. 83, *T. alburnus*, sp. n., p. 85, *T. obscurus*, sp. n., p. 86, and *T. aeneus*, sp. n., p. 87; all from southern Brazil.

Tetragonopterus ortonii and *Astyanax carolineæ*, spp. nn., Gill, P. Ac. Philad. 1870, p. 92, Upper Amazon.

Roeboides myersi, sp. n., Gill, l. c., Upper Amazon.

Hydrocyon brevis figured by Günther in Petherick's Travels in C. Africa, ii. pl. 3. fig. A.

Xiphorhamphus hepsetus perhaps = *X. pericoptes*, Hensel, l. c. p. 88.

Hydrolycus copei, sp. n., Gill, l. c. p. 93, Upper Amazon.

Distichodus rostratus and *Distichodus brevipinnis* figured by Günther in Petherick's Travels in C. Africa, ii. pl. 3. figs. B & C; the latter also by Steindachner, l. c. p. 547, taf. 3. fig. 1.

Distichodus martini, sp. n., Steindachner, l. c. p. 549, taf. 3. fig. 2, Senegal.

Ichthyoborus microlepis figured by Günther, l. c. pl. 2. fig. A.

Pygocentrus altus, sp. n., Gill, l. c. p. 93, Upper Amazon.

CYPRINODONTIDÆ.

Haplochilus senegalensis, sp. n., Steindachner, SB. Ak. Wien, 1870, lxi. p. 559, taf. 7. fig. 2.

SCOMBRESOCIDÆ.

Euleptorhamphus. Mr. Putnam considers this genus to be well founded; but *Eu. longirostris*, *macrorhynchus*, and *velox* are probably one and the same species. Proc. Bost. Soc. Nat. Hist. xiii. 1870, pp. 236-240.

STERNOPTYCHIDÆ.

Gonostoma brevidens, sp. n., Kner, SB. Ak. Wien, lxi. 1870, p. 443, Atlantic.

SALMONIDÆ.

Dr. MURIE has published a paper entitled "Additional Memoranda as to Irregularity in the Growth of Salmon" (Proc. Zool. Soc. 1870, pp. 30-50); it is a continuation of a similar communication in 1868 (see Zool. Record, v. p. 166). The observations are again based on examples which were artificially impregnated and passed through the hands of pisciculturists; they are figured on pl. 2. The author thinks that the migratory species can be retained in fresh water, but not without arrest of development. [Dr. Murie has taken great pains in comparing his examples with descriptions of other Salmonidæ; but detailed descriptions contain of necessity many details characteristic of the individual but not of the species. On the other hand, he does not notice that unmistakable character of *S. salar*, viz. the number of scales between the adipose fin and the lateral line.]

Mr. MORTON ALLPORT has published a "Brief History of the Introduction of Salmon (*S. salar*) and other *Salmonidæ* to the

waters of Tasmania," Proc. Zool. Soc. 1870, pp. 14-30, and "Additional Notes" on the same subject, *ibid.* pp. 750-752.

Salmo leucomænis (Pall.) described by Kner and Steindachner from specimens from Decastis Bay, SB. Ak. Wien, 1870, lxi. p. 435.

Salmo fariopsis, sp. n., Kner, l. c. p. 437, fig. 3, Decastis Bay.

Oncorhynchus proteus (Pall.) described by Kner & Steindachner from specimens from Decastis Bay, l. c. p. 431. The authors think it to be identical with *O. scouleri* (Rich.).

Osmerus dentex, sp. n.?, Kner & Steindachner, l. c. p. 429, Decastis Bay.

Salanx chinensis figured by Steindachner, l. c. p. 629, taf. 5. fig. 1.

HAPLOCHITONIDÆ.

Prototroctes. On its place in the system, and on a new species from New Zealand, *Prototroctes oxyrhynchus*, Günther, P. Z. S. 1870, pp. 150-152.

MORMYRIDÆ.

Mormyrus senegalensis and *Mormyrus thuyi*, spp. nn., Steindachner, SB. Ak. Wien, 1870, lxi. pp. 551, 553, tab. 4. fig. 1, and tab. 2. fig. 3, Senegal.

Hyperopisus occidentalis. This species is referred to *H. dorsalis* by Steindachner, l. c. p. 554, taf. 4. fig. 2.

Mormyrops deliciosus figured by Steindachner, l. c. taf. 5. fig. 1.

GYMNOTIDÆ.

Dr. GÜNTHER arranges the fishes of this family thus (Fish. viii. p. 2):—

1. *Sternarchus* (Cuv.).

a. *Sternarchus* (Gthr.), with 5 species.

β. *Rhamphosternarchus* (Gthr.), with 3 species, one being new, *St. macrostoma*, p. 4.

2. *Rhamphichthys* (M. & T.).

a. *Rhamphichthys* (Gthr.), with 3 species.

β. *Brachyrhamphichthys* (Gthr.), with 3 species.

3. *Sternopygus* (M. & T.), with 5 species; new, *St. axillaris*, p. 8.

4. *Carapus* (M. & T.), with 1 species.

5. *Gymnotus* (Cuv.), with 1 species.

OSTEOGLOSSIDÆ.

Heterotis niloticus figured by Steindachner, SB. Ak. Wien, 1870, lxi. p. 565, taf. 8. fig. 2.

CLUPEIDÆ.

Dr. BLEEKER's 23rd part of the 'Atlas Ichthyologique,' which contains figures of a part of the East-Indian species, has been noticed above, p. 82.

Chupea harengus. A case of true hermaphroditism described by J. A. Smith, Journ. Anat. & Physiol. iv. 1870, p. 258.

Pellomula vorax figured by Steindachner, SB. Ak. Wien, 1870, lxi. p. 570, taf. 7. fig. 3.

SYMBRANCHIDÆ.

Dr. GÜNTHER (Fish. viii. p. 12) divides this family into three groups: *Amphipnoina*, *Symbranchina*, and *Chilobranchina*.

MURÆNIDÆ.

Dr. GÜNTHER has treated of the fishes of this family in vol. viii. of the Catalogue of Fishes. With regard to the distinction of species and genera, synonymy and arrangement, he differs considerably from Dr. Kaup. The following is the arrangement proposed:—

MURÆNIDÆ PLATYSCHISTÆ.

Group A. NEMICHTHYINA, with 1. *Nemichthys scolopacea*.

Group B. SACCOPHARYNGINA, with 2. *Saccopharynx flagellum*.

Group C. SYNAPHOBRANCHINA, with 3. *Synaphobranchus pinnatus*.

Group D. ANGUILLINA.

4. *Anguilla* (Cuv.), with 38 species; new are *A. fidjiensis* (p. 26) and *A. aneitensis* (p. 34).

5. *Conger* (Kaup), with 9 species: *Conger macrops*, sp. n., from the West Indies and Madeira, p. 40.

6. *Congromuræna* (Kaup), with 10 species: *C. melissii*, sp. n., St. Helena, p. 42.

7. *Uroconger* (Kaup), with 1 species.

Group E. HETEROCONGRINA.

8. *Heteroconger* (Blkr.), with *H. polyzona* (Blkr.) and *H. longissimus*, sp. n., from Lanzarote, p. 45.

Group F. MURÆNESOCINA.

9. *Murænesox* (M'Cl.), with 4 species.

10. *Nettastoma* (Rafin.), with 1 species.

11. *Saurenehelys* (Ptrs.), with 1 species.

12. *Oxyconger* (Blkr.), with 1 species.

13. *Hoplunnis* (Kaup), with 1 species.

14. *Neoconger* (Girard), with 1 species.

Group G. MYRINA.

15. *Myrus* (Kaup), with 2 species.

16. *Myrophis* (Lütken), with 2 species.

17. *Paramyrus* (g. n., p. 51), with *P. cylindroideus* (Ranzani) and *P. microchir* (Blkr.).

18. *Chilorhinus* (Ltk.), with 1 species.

19. *Murænichthys* (Blkr.), with 7 species: *Murænichthys moorii*, sp. n., p. 53; hab. —?

Group H. OPHICHTHYINA.

20. *Lüuranus* (Blkr.), with 1 species.

21. *Ophichthys* (Gthr.), with 85 species. New are:—*O. adspersus*, from China, p. 57; *O. calamus*, from Freemantle, p. 74; *O. playfairii*, from Zanzibar, p. 76; *O. pacifici*, from Chili and Peru, p. 76; *O. dromicus*, from West Africa, p. 80; *O. quincunciatus*, hab. —?, p. 83; *O. timorensis*, p. 86; *O. tenuis*, hab. —?, p. 88; *O. kirkii*, from Rovuma Bay, p. 89.

Group I. PTYOBANCHINA.

22. *Moringua* (Gray), with 6 species.

MURÆNIDÆ ENGYSCHISTÆ.

Group K. MURÆNINA.

23. *Myroconger compressus*, g. et sp. n., St. Helena, p. 93.
 24. *Muræna* (Gthr.), with 104 species. New are:—*M. dovii*, from Panama, p. 103; *M. microspila*, from the East-Indian archipelago, p. 109; *M. sanctæ helenæ*, p. 115; *M. callorhyncha*, from Freemantle, p. 122; *M. euptera*, from Raoul Island, p. 122.
 25. *Gymnomuræna* (Blkr.), with 6 species, one of which is new, viz. *G. bennettii*, from the Mauritius, p. 135.
 26. *Enchelycore* (Kaup), with 2 species.

In an appendix to this family the author treats of the *Leptocephalidæ*. He distinguishes between really Leptocephaline forms and such as have been very improperly referred to the same group. He is inclined to regard the former as the offspring of Murænoids, but as individuals arrested in their development at a very early period of their life, yet continuing to grow to a certain size without corresponding development of their external organs, and perishing without having attained the characters of the perfect animal. To this form belong all the various *Leptocephali* and *Hyoprorus*. *Tilurus* is a similar form arrested in its development, but cannot be the offspring of a Murænoid fish. *Stomiasunculus* (Kaup) is the young of *Stomias*, *Porobronchus* (Kaup) the young of *Fierasfer acus*, and *Esunculus* (Kaup) probably that of *Alepocephalus*.

Ophichthys serpens is described and figured as *Ophisurus novæ zelandiæ* (sp. n.) by Dr. Hector, Tr. N. Z. Inst. ii. 1870, p. 34, pl. 3. With anatomical notes by Knox.

Gymnothorax argus, sp. n., Steindachner, SB. Ak. Wien, 1870, lxi. p. 639, taf. 4, west coast of Mexico.

Muræna nigra, sp. n., Day, P. Z. S. 1870, p. 702, Andaman Islands.

PEGASIDÆ.

These fishes are not Lophobranchs; they resemble, in several points, even the Acanthopterygians; and Prof. Steenstrup places them with the *Cataphracti*. Günther, Fish. viii. p. 146.

Pegasus volans (L.) figured by Duméril, Ichth. génér. ii. pl. 26. fig. 1 (*P. laternarius*).

LOPHOBRANCHII.

Dr. GÜNTHER has arranged these fishes as follows (Fish. viii. p. 150):—

Fam. 1. SOLENOSTOMIDÆ.

1. *Solenostoma* (Lac.), with 3 species.

Fam. 2. SYNGNATHIDÆ.

First group. SYNGNATHINA.

1. *Siphonostoma* (Kaup), with 2 species.
2. *Syngnathus* (auct.), with 53 species. New are :—*S. louisianæ*, p. 160; *S. alternans*, from the Seychelles, p. 162; *S. affinis*, from Louisiana, p. 163; *S. modestus*, hab. —?, p. 166; *S. ceylonensis*, p. 168.
3. *Ichthyocampus* (Kaup), with 4 species. New are *I. scalaris* and *I. filum*, from Australia, pp. 177, 178.
4. *Nannocampus subosseus*, g. et sp. n., from Freycinet's Harbour, p. 178.
5. *Urocampus nanus*, g. et sp. n., from Manchuria, p. 179.
6. *Doryichthys* (Gthr.), with 25 species, one of which is new, *D. sculptus*, from the Feejee Islands, p. 185.
7. *Cælonotus* (Ptrs.), with 3 species, one of which is new, *C. biocellatus* hab. —?, p. 188.
8. *Stigmatophora* (Kaup), with 2 species.
9. *Nerophis* (Kaup), with 9 species.
10. *Protocampus* (g. n., p. 193), for *S. hymenolomus* (Rich.).

Second group. HIPPOCAMPINA.

11. *Gastrotokus* (Kaup), with 1 species.
12. *Solenognathus* (Swains.), with 3 species, one of which is new, *S. spinosissimus*, from Tasmania, p. 196.
13. *Phyllopteryx* (Swains.), with 3 species.
14. *Acentronura* (Kaup), with 2 species, one of which is new, *A. tentaculata*, from the Red Sea, p. 516.
15. *Hippocampus* (Leach), with 26 species. New are *H. angustus*, from Freycinet's Harbour, p. 200; and *H. erinaceus*, hab. —?, p. 206.

Prof. DUMÉRIL (Ichth. génér. ii.) retains *Pegasus* in the Lophobranchs as an order (*Hypostomidés*); the real Lophobranchs form a second order, *Prostomidés*, which are divided thus :—

Fam. 1. SOLENOSTOMIDÆ.

1. *Solenostomus*, with 4 species, one being new, *S. bleekeri*, from the Mauritius, p. 498.

Fam. 2. SYNGNATHIDÆ.

Subfam. A. HIPPOCAMPINI.

1. *Hippocampus* (Cuv.), with 28 species. New are :—*H. kaupii*, hab. —? p. 586; *H. rhynchomacer*, from the East Indies, p. 519; *H. borboniensis*, p. 520.
2. *Acentronura* (Kaup), with 1 species.
3. *Gastrotokus* (Heck.), with 1 species.
4. *Solenognathus* (Swains.), with 2 (3) species.
5. *Halicichthys* (Gray), with 1 species.
6. *Phyllopteryx* (Swains.), with 2 species.

Subfam. B. SYNGNATHINI.

1. *Halicampus* (Kaup), with 1 (2) species.
2. *Trachyrhamphus* (Kaup), with 3 (4) species.
3. *Ichthyocampus* (Kaup), with 3 species.
4. *Cælonotus* (Ptrs.), with 1 species.
5. *Syngnathus* (Kaup), with 52 species; as new are described :—*S. dume-*

rilli, from France, p. 556; *S. dekayi*, from Nova Scotia, p. 570; *S. platyrhynchus*, from Noukahiva, p. 571; *S. milbertianus*, from New York, p. 573; *S. verreauxianus*, from Tasmania, p. 573; *S. bairdianus*, from Mexico, p. 574; *S. coquerellii*, from Madagascar, p. 575.

6. *Siphonostoma* (Kaup), with 5 species.

7. *Leptoichthys* (Kaup), with 1 species.

8. *Leptonotus* (Kaup), with 2 species.

9. *Stigmatophora* (Kaup), with 2 species.

10. *Atelurus germani* (g. et sp. n.), from Cochin China, p. 584.

Subfam. C. DORYRHAMPHINI.

1. *Doryrhamphus* (Kaup), with 2 species.

2. *Belonichthys* (Ptrs.), with 1 species.

3. *Cherorchthys* (Kaup), with 1 species.

4. *Microphis* (Kaup), with 22 species, one being new, *M. jouani*, from New Caledonia, p. 592.

5. *Hemihylacus* (Kaup), with 3 species—new being *H. rocaberti*, from Manilla, p. 600, and *H. petersii*, from Puerto-Montt, p. 600.

Subfam. D. NEROPHINI.

1. *Nerophis* (Kaup), with 4 species.

2. *Entelurus* (A. Dum.), with 5 species.

3. *Hymenolomus* (A. Dum.) = *Protocampus* (Gthr.).

Solenostomus paradoxus figured by Duméril, Ichth. génér. ii. pl. 26. fig. 2.

PLECTOGNATHI.

In the arrangement of this order Dr. GÜNTHER has adopted only a few of the genera proposed by more recent ichthyologists, so that it need not be given here; he admits 3 genera of *Triacanthina*, 3 of *Balistina*, 1 of *Ostraciontina*, 1 of *Triodontina*, 8 of *Tetrodontina*, 1 of *Molina*. Fish. viii. p. 207.

Balistes powelli is described as a new species from Newport, R. I., by Cope, P. Ac. Philad. 1870, p. 120.

Monacanthus. Günther (l. c.) describes the following new species:—*M. oculatus*, p. 235, Port Lincoln; *M. occidentalis*, p. 237, West Indies; *M. nematophorus*, p. 241, China or Borneo?; *M. gunnii*, p. 247, Tasmania; *M. convexirostris* and *M. multiradiatus*, p. 248, South Australia and New Zealand; *M. trachylepis*, p. 248, Australia.

Tetrodon. Günther (l. c.) describes the following new species:—*T. heraldi*, p. 283, Eastern Pacific; *T. formosus*, p. 283, South America; *T. cutaneus*, p. 287, St. Helena; *T. punctatissimus*, p. 302, Panama; *T. caudofasciatus*, p. 304, hab. —?; *T. sœ. helenæ*, p. 304.

Tetrodon fluviatilis figured by Steindachner, SB. Ak. Wien, 1870, lxi. p. 640, taf. 5. fig. 2.

Tetrodon spengleri (Bloch) described as *Canthogaster lobatus*, sp. n., by Steindachner, l. c. fig. 3.

Tetrodon trichocephalus is described as a new species from Newport, R. I., by Cope, l. c. p. 120.

Chilomycterus affinis, sp. n., Günther, l. c. p. 314, hab. —?

Trichocyclus erinaceus, g. et sp. n., Günther, l. c. p. 316, hab. —?

Orthogoriscus. Günther, l. c. p. 317, distinguishes only two European species, *O. mola* and *truncatus*.

Orthogoriscus and *Molacanthus*. Putnam does not think that the latter can be the young state of the Sunfish. An abstract of his paper is published in Amer. Natur. iv. 1870, pp. 629-633.

Orthogoriscus mola. F. Wahlgren describes and figures an old example (*Mola nasus*) in Act. Univers. Lund f. 1867 (1868), pp. 18, with a plate.

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Petromyzon omali figured by Van Beneden in Mém. Ac. Belg. xxxviii. 1870, pl. 8.—Dr. Günther regards this fish as identical with *P. fluviatilis*, Fish. viii. p. 503.

Myxine affinis, sp. n., Günther, Fish. viii. p. 511, hab. — ?

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Amphioxus lanceolatus. Observations on the structure of the notochord by E. Moreau, Compt. Rend. 1870, lxx. pp. 1006-1008; and on the cranial region, pp. 1189-1191.

MOLLUSCA

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THE GENERAL SUBJECT.

Anatomy and Morphology.

The starting-point of LACAZE-DUTHIERS's researches on the morphology of *Mollusca* (*l. c.*) is the development of *Ancylus*. He distinguishes three principal parts of the body, viz. the head, the foot, and the visceral sac, which is enveloped by the mantle. There are four principal ganglia, viz. the stomato-gastric, the cerebroid, the pedal, and a fourth group composed of five ganglia, which he calls branchio-cardio-pallio-genital, or, for brevity's sake, the median or inferior centre of the nervous system. Each fold of the common integument, which receives nerves from this centre, is to be termed mantle—for example the shield of *Limax* and *Arion*, but not the lateral lobes of *Aplysia*, which belong really to the foot (C. R. 1869, p. 1344; Ann. N. H. v. p. 383).—The asymmetry of the Gastropods extends only to the fourth of the aforesaid groups and to the parts influenced by it; and the author endeavours to explain the different situation of the subordinate ganglia belonging to this centre in various orders by supposing a torsion of the whole system in the *Pectinibranchiata* and in *Cyclostoma*. In similar manner, also, the normal position of the gill is on the right; but in the *Pectinibranchiata* a part of the mantle which should be typically on the right is thus transported to the left, and with it the gill. The *Lamellibranchiata* are morphologically the most simple and therefore most easy to be understood among the Mollusks; *Anodonta* is taken as an example. The upper or buccal adductor muscle is in all Bivalves above the mouth; the anal orifice in all behind and below the inferior or anal adductor; the visceral mass with the foot is in all Bivalves separated by the mouth from the anterior adductor, and situated between the mouth and the posterior adductor. This suffices to prove that in the *Monomyaria* the anal muscle is present (as was long ago urged

by Cuvier and Oken), but the buccal has disappeared and is not united with the other. The author assumes the mouth to be situated upwards and the hinge backwards, which is at variance with the real situation of most Bivalves and with modern usage. C. R. 1870, pp. 43-46, 102-105.

The observations of TROSCHEL, QUOY, and especially PANCERI, on the secretion of free sulphuric acid in the salivary glands of some Gastropods belonging to the families *Cassididae*, *Ranellidae*, and *Pleurobranchidae* (cf. Zool. Rec. vi. p. 515), are recapitulated in Am. J. Sc. (2) xix. pp. 420-422.

The anatomical researches of W. H. DALL concerning *Patella*, *Siphonaria*, *Gadina*, and *Pompholyx*, of C. SEMPER concerning *Nanina* and allied genera, and of R. BERGH concerning *Triboniophorus* and *Philomycus* will be mentioned in the special part.

C. SEMPER insists that the usual term *epidermis* for the outer coat of many shells is wrong, as it is not formed by cells, and proposes the term *cuticula* for it. Reis. Arch. Philipp. iii. p. 6.

Monstrosities.

Albino or hyaline varieties of various species are noticed. Albinos of *Helix grisea*, L., = *cincta*, Müll., observed by Dr. Martinati to produce normal offspring. E. de Betta, Moll. prov. Veron. pp. 60, 61.—Albino of *Limnæa auricularia* (L.), E. v. d. Broeck, Ann. mal. Belg. iv. 1869, p. 90.

Roffiaen has unsuccessfully tried to produce artificially scalaroid varieties by applying gypsum to the aperture of living species of *Helix* during their growth. Ann. mal. Belg. iii. (1868) pp. lxxxii-lxxxiv.

Subscalaroid specimens of *Clausilia nigricans* are noticed by E. v. d. Broeck, Ann. mal. Belg. iv. 1869, p. 81.—Sinistral specimen of *Planorbis complanatus* (L.) [*marginatus*], the keel being likewise at the under angle, observed by the same, l. c. p. 83, pl. 2. fig. 1.

Lanistes ovum, Peters, with a pale yellow band, beginning at the trace of a former fracture, and becoming more and more indistinct in the progress of growth. Martens, Nachr. mal. Ges. ii. p. 125.

Nassa reticulata, *Natica monilifera* and *nitida* are sometimes irregularly prolonged at their aperture by a colony of *Hydractinæ* occupying their surface, while their cavity is tenanted by *Pagurus bernhardus*. Colbeau, Ann. mal. Belg. iii. p. lxi. [Such shells are very common on the shores of Holland and Sleswick. *Buccinum undatum* is sometimes similarly deformed.]

GEOGRAPHICAL DISTRIBUTION.

a. LAND AND FRESHWATER MOLLUSCA.

1. Northern and Central Europe.

Great Britain. *Helix personata*, Lam., new to the United Kingdom, occurs in Ireland. Jeffreys, Ann. N. H. (4) vi. p. 423.

A list of (25) land and (12) freshwater shells observed in the Isle of Wight in the summer of 1869 is published by Leconte, Ann. mal. Belg. iv. (1869) pp. lxi-lxvi; the most remarkable is *Helix acuta* (Müll.).

Germany. C. KREGLINGER (l. c.) gives a very complete list of books and papers bearing on the subject, and enumerates the

species systematically, with full citations and indication of localities. The occurrence in alluvial and diluvial deposits in Germany is also indicated. 48 genera and 347 species of land and freshwater Mollusca are enumerated. This book, worked out with great care and zeal, will prove very useful to every one who is interested in the geographical distribution and literature of the European extramarine Mollusca. [A few remarks by the Recorder will be found in the Nachr. mal. Ges. ii. pp. 99-102 and 110-117.]

E. VON MARTENS has continued his arrangement of the literature bearing on the distribution of the German Mollusca (Zool. Rec. v. p. 521), treating of the middle and northern parts of Germany beyond the system of the Rhine. Nachr. mal. Ges. ii. pp. 3, 17, 33, 65, 121, 137, 153.

E. v. MARTENS calls the attention of the German conchologists to the geographical distribution of certain land-shells. *Cyclostoma elegans* (Müll.) is found along the Rhine and in some parts of the system of the Weser, and even along the little river Unstrut; but is wanting to the east and south-east of this region, except in a little area on the slope of the Austrian Alps towards Hungary. This species is very often accompanied by *Helix cartusiana*, Müll., the distribution of which, however, is somewhat more restricted in the western and more extended in the south-eastern district. *Helix bidens* (Chemn.), on the other hand, is common throughout Germany eastward of a line going from Hamburg to Augsburg; westward of this line it is found in diluvial deposits only, and is wanting in the greater part of the Alps. It is suggested that agriculture acts in a directly opposite manner on these two species. *Azeca menkeana* (C. Pfr.) occurs in Germany, with the latter, in the central parts of the systems of the Rhine and the Weser, but is quite absent in Southern Europe. Nachr. mal. Ges. ii. pp. 157-160, 169-172, and SB. nat. Fr. 1870, pp. 57-59.

Courland. 55 species of land and 52 of freshwater mollusca are enumerated by F. H. KAWALL, Ann. mal. Belg. iv. (1869) pp. lxxviii-lxxv.

Pomerania. LEHMANN enumerates 115 species of land and freshwater mollusca living in this province; among the more remarkable are *H. vindobonensis (austriaca)*, acclimatized by H. Dohrn, *Helix lamellata*, *bidens*, *incarnata* (but no *personata* or *obvoluta*!), *Bulinus tridens*, *obscurus* (no *montanus*!), *Clausilia ventricosa*, *plicatula*, *nigricans*, *plicata*, *similis*, *cana*, *laminata*, *Planorbis acies*, *discoides*, *Amphipeplea glutinosa*, &c. Mal. Bl. xvii. pp. 94-98.

Mark-Brandenburg. *Cyclas solida* (Normand) and *Pupa frumentum* (Drap.), found at Oderburg, are added by Dr. REINHARDT and the RECORDER. Friedel, Zool. Gart. 1870, p. 387.

Hamburg. The land and freshwater shells of the environs of Hamburg, Lübeck, Kiel, and some parts of Holstein and Sleswick are reviewed from new observations by E. FRIEDEL. *Hyalina excavata* (Bean), hitherto only known as British, found near Glückstad in Sleswick; *Cyclas pisidioides* (Gray) on the island of Föhr. Mal. Bl. xvii. pp. 36-71.—Some additions concerning *Hyalina subterranea* (Bourg.), *Limnaeus glaber* (Müll.), and *L. silesiacus* (Scholtz) are given in Nachr. mal. Ges. ii. pp. 97, 98.—C. WESSEL

gives a list of 25 species of land and 35 of freshwater shells observed near Hamburg, and adds some others from Holstein. *Nachr. mal. Ges.* ii. pp. 74-76.

Belgium. COLBEAU (*Ann. mal. Belg.* vol. iii. 1868, pp. 85-111) enumerates 103 land and 74 freshwater species from Belgium (besides 7 submarine species as *Alexia*, *Otina*, and *Assiminea*); a few new species and some varieties are represented on three plates; the names of them will be mentioned in the special part.—Numerous particulars referring to malacological excursions and observations on various species by MM. Weyers, Colbeau, Stacs, Malzine, Leconte, E. van den Broeck, and A. Craven will be found in the proceedings (*Bulletin des Séances*), which are printed with the 'Annales.' We shall only mention out of them that in the numerous and large ponds in the heath of La Campine, near Antwerp, no other mollusk can be found than *Pisidium casertanum*, var. *lenticulare*; Weyers (vol. iii. p. xx) records *Physa acuta* (Drap.) as a new species for Belgium, having been found at Blankenberg by Malzine, vol. iii. p. lvii, and by E. van den Broeck at Brussels, vol. iv. p. xcv, and that the same has observed *Bithynia* [better *Hydrobia*] *vitrea*, var. *bulimoides* (Mich.), in the province of Antwerp, in a ditch filled with *Elodea canadensis*, vol. iv. p. xcv. The following volume, destined for 1870 but published in 1871, also contains accounts of malacological excursions by E. van den Broeck, and Moulon and Purves, the last relating to the Belgian Ardennes.

Silesia. G. ROHRMANN has described a malacological excursion in the Silesian Mountains (*Nachr. mal. Ges.* ii. pp. 172-176). O. Reinhardt has given a malacological monograph of the mountain Zobten; he enumerates 47 species of land and 3 of freshwater shells found on its slopes, two of them only not observed by himself. The most remarkable are *Helix solaria*, Menke, *Hyalina glabra* (Stud.), *Clausilia cruciata*, Stud., *Cl. silesiaca*, A. Schmidt, and *Helix carpatica*, Friv., the last not observed there by himself, none of which are found elsewhere in North Germany; so that the Zobten appears to be an outlying post of a Southern or Carpathian fauna. *Nachr. mal. Ges.* ii. pp. 185-196.—A supplement to the enumeration of the land and freshwater mollusca found near Görlitz is given by O. v. MÖLLENDORFF in the *Abh. Ges. Görl.* vol. xv.

Thuringia. DUFFT enumerates 48 species of land and 42 of freshwater mollusca observed by him at Rudolstadt; among them may be mentioned:—*Helix ericetorum*, Müll., on limestone with dark bands, on sandy ground always pale; *H. holoserica*, Stud., and *personata*, Lam., rare; *Bulimus radiatus*, Brug., = *detritus* (Müll.), plentiful, but only on oolitic rocks; *Clausilia biplicata* (Mont.) and *laminata* (Mont.) in the proportion of 5 to 1; *Clausilia ventricosa*, only on rotten wood; *C. nigricans* (Pult.) only on schistaceous soil; *Cl. parvula*, Stud., very common; *C. plicata*, Drap., rare. *Nachr. mal. Ges.* ii. pp. 108-110.—A number of land and freshwater mollusca obtained at Liebenstein are mentioned by H. C. KÜSTER, *Ber. Ges. Bamb.* viii. pp. 32-39.

Hesse. O. SPEYER enumerates 46 species of land and 30 of freshwater mollusca observed at Fulda, *B. Ver. Naturk. Fulda*, i. pp. 1-27.—H. ICKRATH gives a list of 36 land and 18 freshwater shells found by him near Darmstadt. *Nachr. mal. Ges.* ii. pp. 38-41.

The numerical proportions of the small land-snails found in the recent sediment on the banks of the Main are given by HEYNEMANN (*Nachr. mal. Ges.* ii. p. 147). *Pupa muscorum* and *Helix pulchella*, including *costata*, are

the most frequent; next to them the species of *Vertigo*, *Cionella*, *Helix hispida*, and *Carychium*. Species of larger size are very rare.

Notes on some malacological excursions in *Switzerland* and *Elsass* by E. ENGEL and FAUDEL in 'Feuille des jeunes Naturalistes,' May-July.

Bavaria. Dr. WALSER notes the occurrence of various species of land and freshwater shells in different parts of Bavaria. Nachr. mal. Ges. ii. pp. 93-96. Among them may be mentioned *Unio platyrhynchus* in the Chiemsee, a peculiar form of *Limnæa* in the Walchensee, and *Helix candidula* near Munich.

Bohemia. A few additions to the malacological fauna of Carlsbad and Franzensbrunn (Zool. Rec. ii. p. 220) are given by LEHMANN, Mal. Bl. xvii. p. 98; two of them, *Pupa substriata* and *Clausilia cana*, are not mentioned by Slavik.

Galizia. The land and freshwater shells of this province, hitherto very little known, are enumerated by Dr. J. JACHNO (Verh. z.-b. Wien, 1870, pp. 45-58); there are 94 species of land and 45 of freshwater shells. Some of these belong to the Carpathian centre, as *Helix austriaca*, *pietruskiana*, *carpatica*, *cingulella*, *faustina*, *lutescens*. *Melanopsis esperi* has been found in some Podo-lian streams within the province, but only in a subfossil state.

Transylvania. E. A. BIELZ has published a list of 69 species, containing 48 land and 21 freshwater shells, found near Klausenburg; among them are twelve species peculiar to Transylvania, but not one of the so-called *Baleo-clausiliae*. A few more occur in the vicinity on Jura limestone—for example, *Helix rupestris*, *faustina*, *Pupa avenacea*, *Clausilia bielzi*. The paper is written in the Magyar language; but a nearly complete German extract follows it, in which, however, *Helix solaria*, Menke, no. 14, has been omitted by inadvertence.

Danube. Thirty-eight species of freshwater shells from the mouth of the Danube are enumerated by Bourguignat, Ann. Mal. i. pp. 37-76, among which are no less than 9 species of *Vivipara*, 1 *Lithoglyphus*, 1 *Melania*, 4 *Melanopsis*.

France. Several French conchologists have contributed their part to a "Prodrome à l'histoire malacologique de la France," viz. J. MABILLE the *Limacidae*, MASSOT the genus *Testacella*, PENCHINAT the genera *Parmacella* and *Daudebardia*, and PALADILHE the *Paludinidae*. Ann. Mal. pp. 105-244. The numbers of species in the individual genera will be mentioned in the special part.

2. Mediterranean Basin.

Several new species from Southern France, Spain, and Algeria described by BOURGUIGNAT, R. Z. 1870, pp. 14, 87, 166, from Southern France also by ST. SIMON and REYNES, Ann. Mal. i. pp. 20 and 35.

Some rather rare species of land-shells found by A. Villa in Val della Crosa, Val Maggio, and Val Sabbia, in the Italian Alps, are mentioned, Bull. mal. Ital. iii. p. 32.

Southern Tyrol. E. DE BETTA, who published in 1852 a pamphlet concerning the terrestrial mollusks of Val di Non, has given a new list of the land and freshwater mollusks of that valley. He enumerates 79 species of land and only 8 of freshwater mollusks; the latter are *Limnæa peregra* (Müll.), *rubiginosa*, Betta, and *truncatula* (Müll.), *Bithymia tentaculata* (L.),

and [*Hydrobia*] *schmidtii* (Charp.), *Valvata cristata*, Müll., *Anodonta cellensis* (Gmel.), and *Pisidium amnicum* (Müll.); the absence of the larger species of *Limnæa* and *Paludina* is highly characteristic of the mountainous region. Among the land-shells Central-European species are mixed with others peculiar to the southern slope of the Alps, for example *Helix incarnata*, *fruticum*, *obovata*, with *cingulata*, *angigyra*, *æmula*, and others. Some errors in the former paper of the same author are here corrected.

Verona. E. DE BETTA enumerates 153 species of Mollusca living in the Province of Verona, 92 of which are terrestrial, the rest freshwater. Many of these are real novelties for this fauna, as:—*Vitrina brevis* (Fér.), on the Montebaldo; *Zonites hyalinus* (Fér.), *hydatinus* (Rossm.), *Helix lurida*, Ziegl., *æmula*, Rossm., *Bithynia ventricosa*, Gray, &c. The genera and subgenera are carefully characterized and critical remarks appended to the species. The existence of *Melania holandri* (Fér.) within the province has not received confirmation, and it is probably to be cancelled.

Venice. E. DE BETTA comprises 138 land, 70 freshwater, and 6 submarine species, viz. two *Auriculidæ* and four *Hydrobiæ*, which he wrongly calls *Bithynia*. As the province extends from the Alps to the sea, we find among them species which are peculiar to the mountains, and especially to those of Friul and part of Carniola, as *Helix intermedia*, Fér., *æmula*, Rossm., *phalerata*, Ziegl., *lurida*, Ziegl., *leucozona*, Ziegl., *Clausilia costata*, Ziegl., *cincta* (Brumati); others more peculiar to Lombardy, as *H. angigyra* (Jan), *Unio bonelli* (Fér.); and some characteristic of the seashore, as *Helix pisana*, Müll., *trochoides*, Poir., &c. The genus *Clausilia* is represented by 22 species, *Pupa*, including *Vertigo*, by 15, *Neritina* by 9 species. Ist. Ven. vol. xv.

Thirty-one species of land-shells collected by A. Issel at Tabiano near Parma, and 15 found by Prof. Trinchese at Lecce near Salento, are enumerated by the former, Bull. mal. Ital. iii. pp. 167–169.

The stray notes concerning land and freshwater shells of the continent of Middle and Southern Italy are collected and arranged geographically by E. v. Martens in an appendix to Bull. mal. Ital. iii. 1870, to which the editor, C. Gentiluomo, has added some introductory and bibliographical remarks.

Umbria. Thirty-one species of land and 3 freshwater shells, collected by G. BELLUCCI near Terni and Perugia, are enumerated, Bull. mal. Ital. iii. pp. 113–118. The most remarkable among them are *Helix hispana*, L. [*planospira*, Lam.], *strigata*, Müll., *Clausilia leucostigma*, var. *opalina*, Ziegl., and *C. piceata*, Ziegl., *Bithynia boissieri* (Charp.), and *Planorbis subangulatus*, Phil.

Tuscany. The occurrence of *Melanopsis dufourei*, Fér., ascertained by F. L. Appellius, Nach. mal. Ges. p. 44.

Rome. Twenty-four species of land-shells, collected by GUST. MANTOVANI in the vicinity of Rome, including the Alban hills and the valley of the Anio, are enumerated by GENTILUOMO (Bull. Mal. iii. pp. 41–43). The most remarkable are:—*Zonites candidissimus* (Drap.), Monte Mario, only one specimen; *Helix ligata*, Müll. [*gussoneana*, Shuttl.], Monte Sacro, Monte Mario, Subiaco and Frascati; *Helix nemoralis*, the variety in which all five bands are confluent, only at Subiaco, but abundant; *setipla*, Zeigl., Subiaco and Tuscolo near Frascati; *strigata*, Müll., Subiaco; *Clausilia piceata*, Ziegl. Bull. mal. Ital. iii. pp. 37–43.

Sicily. The extramarine shells found on and near Mount Etna are briefly enumerated by A. ARADAS, Att. Soc. Ital. xii. pp. 533-544.

Algeria. LETOURNEUX describes several of his malacological excursions in Kabylia, Ann. Mal. p. 258.

Cyprus. Some land-shells mentioned by HEYNEMANN, Nachr. mal. Ges. ii. p. 126.

3. *Africa.*

Eastern Africa. Some shells collected by the botanical traveller, Georg Schweinfurth, on the banks of the Bahr-el-ghazal and its confluent about 7-8½° N. lat., system of the White Nile, are enumerated by the Recorder, Mal. Bl. xvii. pp. 32-36; among them is a new *Planorbis* of a rather American aspect.

Abyssinia. Twenty species of land and 10 of freshwater shells found during the British expedition (1867-68) in Abyssinia are enumerated by W. T. Blanford in Obs. on Abyss. pp. 473-477, some of them new, but these neither named nor sufficiently described. The more remarkable are:—a *Helix* allied to *subrostrata* and *pisana*, from the limestone tract north of Antalo, which is said to occur also in Persia; *Bulimus olivieri*, Pfr., the finest and commonest land-shell of Abyssinia; an *Ennea*, sp. n.; *Pupa cænopicta*, Hutt., common to the East Indies and Senegal; the European *Ancylus fluviatilis*, Müll.; the widely spread *Melania tuberculata* (Müll.): some species are common to Natal. The localities and elevations above the sea-level are carefully given. *Pupa insularis*, Ehrenb., and *Bulimus labiosus* (Müll.), var., are mentioned as inhabitants of Aden.

These results are compared with what was otherwise known concerning Abyssinian shells, in a double list containing about 49 species, by the Recorder in Mal. Bl. xvii. pp. 82-86.

Bourbon. The land-shells of this island are reviewed, from his own observations, by G. NEVILL, J. A. S. B. xxxix. pp. 404-416. He enumerates 41 species: 17 belonging to *Helix* or *Nanina*, 8 to *Gibbulina* or *Ennea*, 6 to the operculated land-shells, among which 4 of *Omphalotropis*. Several species established by Deshayes in Maillard's 'L'île Réunion' are reduced to varieties, and the occurrence of others doubted. *Ennea bicolor* (Hutt.) and *Achatina panthera* (Fér.) are supposed to have been introduced by the agency of man. Several species are common to Mauritius.

South-western Africa. Several land-shells from Damaraland described and figured by H. Adams, P. Z. S. 1870, p. 9, pl. 1. figs. 17, 18, and by L. Pfeiffer, Mal. Bl. xvii. p. 30, and Novitat. Conch. iv. pp. 2, 3, pl. 109.

4. *Asia.*

Samarcand. Four species of shells received from Samarcand are noticed by the Recorder (SB. nat. Fr. p. 56), *Parmacella*, probably *olivieri* (Cuv.), *Helicarion*, sp. n., *Helix krynickii* (Andr.), and *Corbicula fluminalis* (Müll.); three of them are represented by the same or very similar species also in

Transcaucasia, Palestine, and on the shores of the Mediterranean; the *Helicarian*, on the contrary, is an East-Indian form.

British India. Several new species, principally of *Nanina* and *Glessula*, are added by W. T. Blanford; more exact localities for known species are also noticed. J. A. S. B. xxxix.

Several land and freshwater shells from the Shan States and Burmah are described by W. Theobald. J. A. S. B. xxxix. pp. 395-402.

Andaman Islands. The shells described as new by Tryon in the preceding year are identified with previously described species, and the occurrence of *Helix achatina* doubted by Stoliczka. P. As. Soc. Beng. 1870, pp. 86-88.

China. Some land and freshwater shells collected in Hainan by Mr. Swinhoe are described and figured by H. ADAMS, P. Z. S. 1870, p. 8, pl. 1. figs. 12-16, and pp. 377-379, pl. 27. figs. 4-13.

Philippines. Part of the land-shells of this archipelago are treated of by Prof. CARL SEMPÉR in the continuation of his work on the results of his travels in the Philippines. Having explored many regions where H. Cuming has not been, especially in the northern parts of the island of Luzon, he adds several novelties to this fauna, and, on the other hand, some of the localities stated in the Cumingian collections are called in doubt by him. He finds a general difference between the fauna of Luzon and that of the southern islands, for example Mindanao—the first being quite peculiar, the latter containing the same genera, or sections of genera, and even in some cases the same species as Borneo and Celebes.

5. *Polynesia and Australia.*

Australia. Ten new land-shells, mostly from Tasmania, described by J. Brazier, P. Z. S. 1870, pp. 659-662.

New Caledonia. New land and freshwater shells are described by Souverbie, Montrouzier, Crosse, Marie, and Gassies in the J. de Conch. xviii.

Pacific Islands. New land-shells from the Navigators' Islands, New Hebrides, Solomon Islands, New Ireland, Fiji, Banks's Group, and Norfolk Island are described by J. Cox, P. Z. S. 1870, pp. 81-85 and 170, 171.

Sandwich Islands. PEASE enumerates 6 species of *Limnæa* and 5 of *Melania* occurring on these islands, three of each being new; no true *Physa* is found there, but sinistral specimens of *Limnæa* have been described as species of *Physa*. Am. Journ. Conch. vi. pp. 4-7.—The *Achatinellæ* of the island of Kauai are enumerated and distributed between the two subgenera *Leptachatina* and *Amastra* by Pease, J. de Conch. xviii. pp. 87, 88.

6. *Tropical America.*

A rather large number of land-shells, 201 species, collected by PAZ and MARTINEZ during a Spanish scientific expedition in *Brazil*, *Ecuador*, *Peru*, and *Chile* (see Zool. Rec. vi. p. 525) are enumerated by J. G. Hidalgo, J. de Conch. xviii. pp. 27-70; the localities are carefully indicated, and some so-called species reduced to varieties of others.

The conchological part of L. Netto's description of the Imperial and

National Museum at Rio Janeiro, pp. 300-304, contains very valuable information concerning the Brazilian fauna. The genus *Helix* is said to be common in the rivers [1], and a species of *Clausilia* to be very abundant in the province of Rio Janeiro [probably *Bulinus janeirensis*, Sow., or some other species of the section *Odontostomus* is meant]; *Limax*, several terrestrial species of which are said to live in Brazil, is placed with the bivalves near *Pecten*, being confounded with *Lima*.

Eastern Peru. An additional list of 20 land and 10 freshwater shells collected by E. Bartlett is given by H. ADAMS. P. Z. S. 1870, pp. 374-376.

7. North America.

Massachusetts. The land and freshwater Mollusca are reviewed by W. H. DALL, in P. Bost. Soc. xiii. pp. 246-248 and 252, 253. He enumerates 7 species of slugs, 54 land and 51 freshwater shells.

In the second edition of GOULD's 'Invertebrata of Massachusetts' the Mollusca are worked out by W. G. BINNEY in the same manner as in his former publication [Zool. Rec. vi. p. 526], and illustrated, with the same woodcuts and others recently published, by E. Morse.

Illinois. J. Wolf enumerates 39 land, but 101 freshwater shells (43 species of *Unio*) from Pulton country. Am. J. Conch. vi. pp. 27-29.

East Tennessee. Lewis enumerates 33 species of land-shells, *ibid.* pp. 188-191, and 95 species of freshwater shells from the Holstone river, among which are 64 species of *Unio*, *ibid.* pp. 216-228.

b. FAUNA OF BRACKISH WATER.

East Friesland. In the brackish water of the coasts live *Hydrobia stagnalis* (Baster) and *Limapontia nigra*, Johnst. Metzger, l. c. p. 28.

Baltic. On the eastern shores of Holstein, in the lake of Waterneversdorf, *Neritina* and *Limæa* live together with small reduced specimens of *Mya arenaria*, *Cardium edule* and *rusticum*, some *Rissoæ* and *Littorinæ*. Friedel, Mal. Bl. xvii. p. 56.—The sea-shells observed on the shores near Travemünde, among which *Cyprina islandica* and *Astarte arctica*, and near Kiel, are enumerated by E. Friedel, Mal. Bl. xvii. pp. 42-44, 51, 52, & 56. The sea-shells hitherto known from the shores of Pomerania (only *Hydrobia baltica*, *Littorina rudis*, and five species of bivalves) are enumerated by Lehmann, *ibid.* p. 97; some others found by Boll and Friedel near the island of Rügen are mentioned on the same page.—Three species of true marine shells only have been found by F. H. KAWALL on the shores of Courland, viz. *Mytilus edulis*, *Tellina solidula* [*baltica*, L.] and *Cardium rusticum* [*edule*, L., var.]. Ann. mal. Belg. iv. (1869) p. lxxviii.

c. MARINE FAUNA.

The general results of the last deep-sea dredging by English, Scandinavian, and American naturalists are briefly recapitulated by A. J. MALMGREN, in Öfv. Fin. Soc. vol. xii. 1869, pp. 7-16 (also in German, Z. wiss. Zool. xx. pp. 457-465), and by A. E. VERRILL, Am. J. Sc. (4) xix. pp. 129-134.

Concerning the results of deep-sea dredging in the 'Porcupine,' by Dr. CARPENTER, Prof. WYVILLE THOMSON, and Mr. JEFFREYS in 1869, omitted in the last volume of this Record,

we may refer to the account given in the Proceedings of the Royal Society for Nov. 18; an abstract is also to be found in 'Nature,' Nov.-Dec. 1869. The report of the expedition of 1870 (P. R. Soc. 1870, pp. 146-220) contains the narrative and the hydrographical results; it appears from them that a number of shells known hitherto only in a fossil state have again been dredged in the Atlantic and Mediterranean. The conchological part of the report will be given by Jeffreys in 1871.

DALL remarks that where the water is cooled by northern currents or by glaciers, deep-sea species of mollusks, especially Brachiopods, are found at or even above low-water mark, while these mollusks are only obtained at a depth of many fathoms where the surface is warm. P. Bost. Soc. xii. 1869.

1. Seas of Northern Europe.

The late Prof. MICH. SARS left an elaborate paper on the mollusks of the Christiania fjord, which has been published by his son, G. O. SARS; it contains 2 Cephalopods (*Rossia owenii* and *glaucopsis*), 1 Pteropod (*Spiralis flemingii*), 70 species of Gasteropods and 32 of Bivalves; some rather arctic species occur among them, as *Natica affinis*, Gmel., *Scalaria grœnlandica*, Chemn., *Philine quadrata*, Wood. Several new genera are described and figured, concerning which some remarks made by Jeffreys on the original specimens are added by the editor.

A list of 163 Norwegian marine Mollusca, dredged either in the Christiania fjord at Drobak or, during the expedition of the 'Porcupine,' between 47½° and 60° N. lat., is given by J. Gwyn Jeffreys, Ann. N. H. (4) v. pp. 438-448. Twenty-one of those found at the former locality had not previously been known thence.

E. Friedel brings the number of sea-shells found on the west coast of *Sleswick* and *Holstein* from 65 (see Zool. Rec. v. p. 528) to 106, from his own observations and those of others, and gives also some additions to the malacological literature of this country. Mal. Bl. xvii. pp. 71-78.—Some shells collected on the small island of Neuwerk, at the mouth of the Elbe, by the student GILIN are mentioned, *ibid.* p. 78.

A. Metzger treats the molluscan fauna of the coast of *East Friesland*, between the mouths of the rivers Ems and Jahde, including the islands of Norderney, Wangeroog, and others; he gives first an interesting general account of the occurrence of animals in the different kinds of localities, the "Watten" (estuaries), the strand between tide marks and the "Balgen" or shallow bottoms from low water-mark to 12 fathoms; then follows a systematic list, containing 2 Cephalopods, 18 Prosobranchiate Gasteropods, 1 Pulmonate (*Melampus myosotis*), 13 Opisthobranchiates, and 41 Bivalves found on this coast. JB. Ges. Hannov. 1869-70, pp. 22-30.

Colbeau's list of *Belgian* Mollusca, Ann. mal. Belg. vol. iii. (1868) pp. 85-111, contains 7 species of Cephalopods, 71 marine Gasteropods with shells, only 8 without, and 88 marine Bivalves. Some novelties are also mentioned, pp. xix, xx.—A number of shells found on the shore at Ostend are mentioned by A. Craven and F. de Malzine, l. c. iv. (1869) pp. xcvi-c.

The sea-shells of the coast of *Granville* are enumerated. G. Servain, Ann. Mal. pp. 77-104.

Jordan's Catalogue of British Mollusca is a simple list of names, indicating the varieties, compiled from Jeffreys's 'British Conchology,' and printed on one side only for labels.

2. *Mediterranean Sea.*

H. C. WEINKAUFF has published supplementary notes to his general work on the shells of the *Mediterranean* (see Zool. Rec. iv. pp. 448 & 514). Several species are added, others which had been regarded doubtful are identified with well-known ones, and some names changed on account of priority. Bull. mal. Ital. iii. pp. 14-24, 33-37, 74-100, 128-139.

The drawings of *Adriatic Mollusca* (1272 figures, including some Anne-lids, Cirripeds, and numerous land and freshwater shells) left by STEFANO CHIAREGGHINI, who died at Chioggia near Venice in 1820, at the Lyceum S. Catarina in Venice, have been determined by S. BRUSINA; and a rather verbose account of them is published by the latter in 280 pages, repeating all the manuscript names which have been never published before (for example, *Turbo maritimus* for *Chemnitzia scalaris*, Phil.). It is astonishing to see the number of species (249) known to him; and some interest may be found also in the accompanying notes of the MSS., which state the localities, and have been printed word for word by the editor. The species which have not before been ascertained to live in the Adriatic are enumerated (pp. 34-38); two only have been hitherto observed on the western and not on the eastern side, they are *Corbulomya mediterranea* (Costa) and *Litorina saxatilis* (Olivi, not Johnst.).

The muddy grounds at *Sinigaglia* have been explored with an improved dredge by A. Manzoni; these are very poor in mollusks, being devoid of vegetation; *Turritella*, *Chenopus* [*Aporrhais*], *Philine*, *Akera*, *Dentalium*, *Natica guillemini*, *Doris*, *Tethys*, *Sepia*, and *Loligo* are the only genera which have been found, most of them very numerous. The author insists that all must feed on animal matter. Bull. mal. Ital. iii. pp. 11-14.

The marine mollusks found at Cape Pinède, near *Marseilles*, are enumerated by F. Ancey, Ann. Mal. pp. 244-257.

The recent marine shells found at and near *Catania* are enumerated by A. Aradas, Att. Soc. Ital. iii. pp. 533-544. The short littoral tract between Catania and Riposto, and chiefly that of Aci-Trezza, is extraordinarily rich in sea-shells, some of them very rare, or not found hitherto elsewhere (for example, *Panopea glycymeris*); the sandy shore next Catania, on the contrary, is rather poor.—The Sicilian species described in 1840 and 1841 as new by Prof. C. Maravigna, and always regarded as more or less doubtful, have been examined by L. Benoit and A. Aradas from original specimens, and identified, except one, with well-known ones. Att. Soc. Ital. iii. 1869, and Bull. mal. Ital. iii. p. 56.

A large number of shells dredged in the *Mediterranean* by Captains Spratt and Nares, in various depths, some of 100 fathoms and more, are enumerated by Jeffreys, Ann. N. H. (4) vi. pp. 65-86. Besides several new species, they contain others known hitherto only in a fossil state—for example, *Verticordia granulata*, *Astarte parva*, &c.

Pelagic mollusks, and especially Pteropods, often make their appearance in places where they have never been observed before or afterwards; so in the gulf of Naples in 1864 *Clionopsis krohnii*, in 1865 *Spiralis recurvirostra*, in 1869 *Hyalea inflexa* and *Creseis acicula*. Costa, Ann. Mus. Nap. iii. 1869.

Twenty-nine species of *Mediterranean* Cephalopods are enumerated by Targioni-Tozzetti, Att. Soc. Ital. xii. pp. 587-598.

A very poor list of mollusks found in the *Black Sea* is given by F. Marcussen in the 'Transactions' of the first meeting of Russian naturalists at St. Petersburg, 1868, p. 178.

3. Red Sea.

Seventy-two species of sea-shells, collected in the bays of *Suez* and *Akaba*, are enumerated by P. Fischer, who points out that some of them are identical with or very nearly allied to others from the West Indies. J. de Conch. xviii. pp. 161-179. One only, *Nassa gibbosula* (L.), is said to occur also living in the Mediterranean. [See below, p. 134.]

A large number of sea-shells, collected by Mr. McAndrew in the Red Sea are enumerated (Ann. N. H. (4) vi. pp. 429-450), among which are 355 not contained in Issel's work; the new species among them are described by H. Adams, l. c. pp. 121-129, and P. Z. S. 1870, pp. 5-7, pl. 1. figs. 1-11, and pp. 788-793, pl. 48. figs. 1-19.

A list of 128 species of sea-shells collected in *Annesley Bay*, and nine others obtained in the open sea off the south-east coast of Arabia, is given by W. T. Blanford, Obs. Geol. and Zool. Abyss. pp. 462-471.

4. Seas of India and Tropical Polynesia.

Scattered descriptions of apparently new species occur in the various periodicals, but no paper treating of them separately.

5. Northern Pacific.

A. ADAMS gives a list of 87 species of Probosciferous Mollusks inhabiting the seas of *Japan*. Besides 9 new ones and a large number of tropical Indian species, there are some well-known European forms among them, as *Buccinum undatum*, L., Gulf of Tartary; *B. glaciale*, L., Saghalien; *Purpura hæmastima* (L.), Hakodadi; *P. lapillus* (L.), Hakodadi and other localities; *Nassa mutabilis* (L.), Takanosima and Mososeki; the last is the most remarkable, as in Europe it is confined to the Mediterranean. The genus *Leptocoenochus* is here first indicated from Japan in Madreporas at Kinosima. Ann. N. H. (4) v. pp. 418-430.

The shells of *Monterey* are enumerated by J. G. Cooper; 206 species are named, 126 of them have been first observed on the shore, 80 first found by dredging. Am. J. Conch. vi. pp. 42-70.

The species of *Patella* and allied genera occurring on the *West Coast* are treated by Dall, Am. J. Conch. vi. pp. 227-282.

Several sea-shells from La Paz, *California*, collected by J. Pedersen, are described and others mentioned by A. E. Verrill, Am. J. Sc. xix. pp. 217-227.

6. *Atlantic shores of North America.*

A second edition of GOULD's Report on the Invertebrata of Massachusetts, under the care of W. G. BINNEY, as far as the marine mollusks are concerned, is compiled chiefly from the MSS. of the late author; almost every description is accompanied by a woodcut; the plates of the first edition are not republished, but twelve new ones, beautifully coloured, representing principally naked mollusks, from drawings by Agassiz, Stimpson, &c., are added. Also the species found hitherto only on the shores of Canada, Labrador, &c. are included, so that this very valuable work comprises the whole northern fauna between Davis Straits and Cape Cod.

The marine Mollusca of *Massachusetts* are also reviewed by W. H. DALL, P. Bost. Soc. xiii. pp. 240-257; those of *Lower Canada* by Whiteaves, Canad. Nat. v. 1870; the Bivalves of *New Haven* by Perkins, P. Bost. Soc. xii. p. 138.

Contemporaneous changes of the Fauna.

Hyalina draparnaldi (Beck), at Hamburg observed for some time and perhaps introduced, seems now to be destroyed; *H. aspersa* (Müll.) has also been introduced sometimes by accident, but has never bred there. Wessel, Nachr. mal. Ges. ii. pp. 76, 77. The former has been found also in the palm-house of the Botanical Garden at Berlin with *H. alliaria*. Friedel, *ibid.* p. 176.

Some attempts at acclimatizing land-shells in several localities with negative results are mentioned by Friedel, *ibid.* p. 79.

Helix acuta (Müll.) arrived alive in gardens at Frankfort on palm-trunks. Kobelt, *ibid.* p. 160.

The only locality of *H. vermiculata* (Müll.) within the province of Venice is the Botanical Garden of Padua. Titius, in de Betta's Malacol. Veneta, p. 53. [It was observed there in 1856 by the Recorder, and several years before by his father.]

Helix fatens [var. *duffti*, Kobelt, see Zool. Rec. vi. p. 531] has been found in chinks and clefts of an old wall at Rudolstadt, but is now extinct, though it appears to have lived there probably less than a century ago. Also the variety of *Limnæa palustris*, described by Schröter in 1779 from Rudolstadt, and called *Helix corvus*, cannot be again found at present. Dufft, Nachr. mal. Ges. ii. pp. 108, 109.

Bulimus detritus (Müll.) seems to be nearly extinct at Weilburg in Nassau. Sandberger, Nachr. mal. Ges. ii. p. 183.

Planorbis dilatatus, Gould, introduced at Manchester. Jeffreys, Ann. N. H. (4) iv. p. 341.

Bithynia tentaculata (L.), found living in Lachine Canal, North America, is probably introduced from Europe. Am. J. Conch. vi. p. 284.

The destructive influence of *Elodea canadensis*, when it becomes very luxuriant, upon the *Limnææ* and Bivalves, is observed by E. Friedel, Zool. Gart. 1870, p. 362.

The changes in the molluscan fauna caused by the disappearance of the

woods are incidentally mentioned as regards Sleswick and Holstein by Friedel, Mal. Bl. xvii. p. 60.

Venus mercenaria, L., its acclimatization failed at Arcachon. Möbius, Austern- u. Miesmuschelzucht, p. 11.

Palæontology of Recent Species.

Some remarks on the shells found in diluvial beds near Potsdam are given by E. FRIEDEL. *Helix pulchella* (Müll.) is the only terrestrial species among them; amongst the others are *Paludina diluviana* (Kunth), *Valvata contorta* (Menke), *V. foraminis* (Braun) probably = *macrostoma* (Steenstrup), and *Bithynia tentaculata* (L.). Neither he nor Dr. Reinhardt could find *Tichogonia* [*Dreissena*] in the undisturbed beds, although a few single shells of it are said by others to have been found there or in other diluvial deposits; it is probable that these were recent, and occurred accidentally on the surface of those beds. Nachr. mal. Ges. ii. pp. 177-180.

Subfossil specimens of *Helix nemoralis* (L.), exhibiting a round perforation like that caused in marine shells by *Murex erinaceus*, have been observed by Colbeau, Ann. mal. Belg. iii. 1868, p. lxi.

Melanopsis dufourei (Fér.) has also been found in quaternary limestone-tuff in Tuscany, which proves that it has not been introduced of late years. Appellius, Nachr. mal. Ges. ii. p. 45.

In the elevated prehistoric oyster-banks of the western shores of Sleswick *Ostrea edulis* (L.) and *Ostrea hippopus* (Lam.) are to be found mingled with each other in the same bank. Friedel, Mal. Bl. xvii. pp. 79, 80.

A rather large number of recent Mediterranean shells, found in the pleistocene clay at Ficurazzi and in limestone at Montepulciano in Italy, are enumerated by Allery de Monterosato, Bull. mal. Ital. iii. pp. 44, 45. The shells of the pleistocene clay at the base of Mount Etna are enumerated by A. Aradas in his 'Conchiologia Etnea,' Att. Soc. Ital. xii. 1869.

Not only the quaternary and pliocene beds in Italy, but also those undoubtedly older than the pliocene proper, contain species of shells which do not live at present in the Mediterranean, but in the Northern seas of Europe. G. Seguenza, Bull. mal. Ital. iii. pp. 65-74.

Fourteen species of sea-shells from the recent deposits at the Bitter Lakes near Suez are enumerated by P. Fischer, J. de Conch. xviii. p. 172; they all belong to the recent fauna of the Red Sea, except *Cardium edule* (L.).

Apparent kitchen-middens, containing shells of recent species of sea- and land-mollusks, have been found by F. Stoliczka on the Andaman Islands and described in J. A. S. B. 1870, pp. 1-11.

Mollusks in confinement.

Advice as to keeping and rearing terrestrial mollusca in confinement is given by H. Seibert, *Nachr. mal. Ges. ii.* pp. 72-74.

Collecting and Preserving.

The methods of making and preserving microscopical preparations of the radula and jaw of Gastropods are discussed by W. Kobelt, *Nachr. mal. Ges. ii.* pp. 58-62.

A method of collecting small land-shells, especially those which live in damp places, by taking moss &c. from the irrigation channels of the meadows, and examining them at home fresh and dried, is given by H. Seibert, *l. c.* p. 96.

Classification.

The importance of the dentition for the classification of the Mollusca is discussed by Kobelt, *Ber. Senck. Ges.* 1869-70, pp. 65-71; he comes to the conclusion that neither this nor any other character is absolute.

CEPHALOPODA.

A general account of the Cephalopoda, recent and fossil, is given by H. Woodward, chiefly from posthumous papers of his brother. *Stud. iv.* 1870, pp. 1-14, 241-249, with 4 good plates.

A. LAFONT has made several observations concerning the development of the spermatozoids and the copulation of various species of Cephalopods at Arcachon. The substance of the spermatophores is produced by the glands, which have been called seminal vesicles by Cuvier, and for which the author proposes that of "vésicules d'Edwards;" the spermatozoids themselves come from bodies which resemble in all respects true ovula, and are developed within the testicle. How spermatozoids come into the spermatophores could not be ascertained. The copulation has been observed in *Sepia filliouxii*, Lafont. A male and female interlace their arms, and are situated mouth against mouth; clusters of spermatozoids and the torn remains of the spermatophores are expelled from the funnel of the male, and find their way by the current of the water into the branchial aperture of the female. The arms have, at least in this genus, no direct function in the copulation. *Ann. Sc. Nat.* (5) xi. 1869, pp. 109-133.

MEIGEN's experiments and reasoning concerning the hydrostatic quality of the shell of *Nautilus* result in conclusions similar to those advanced by the late Prof. Keferstein, viz. that the air within the air-chambers of the shell serves only to give to the whole animal a specific weight nearly equal to that of the water, and that the descending or ascending is effected only by the

compression of a small volume of air, some cubic centimetres, in the last or dwelling-chamber of the shell; the principal function of the siphon is said to be to keep a general equilibrium between the air included in the chambers and the pressure of the surrounding water for longer intervals by diffusion through the membrane of the siphon, this action being too slow to come into operation for the locomotion itself. Arch. f. Nat. 1871, pp. 1-34.

S. TRINCHESE's memoir on the nervous system of the Cephalopods, published in 1858, is extracted in full. Bull. mal. Ital. iii. pp. 106-112.

Omastrephes sagittatus (Lam.), Gould, Invert. Mass. p. 510, pl. 25. fig. 340, and *bartramii*, probably the same species, fig. 339.

Loligopsis pavo (Lesueur), Gould, Invert. Mass. p. 509, pl. 26. figs. 341-344, New England.

PTEROPODA.

Creseis conica, sp. n., Costa, Ann. Mus. Nap. iii. 1869, Naples.

Trichocyclus mediterraneus, sp. n., Costa, Ann. Mus. Nap. iii. 1869, Naples.

HETEROPODA.

Recluzia hargravesi, sp. n., Cox, P. Z. S. 1870, p. 172, Port Stephens, New South Wales.

GASTROPODA.

PECTINIBRANCHIATA.

PROBOSCIDIFERA RHACHIGLOSSA.

MURICIDÆ.

Murex. The continuation of Küster's Monograph, part iii., contains 18 species, some copied from Reeve:—*M. semiclausus*, sp. n., p. 111, pl. 34. figs. 6, 7, hab. — ?; *pumilus*, sp. n., p. 118, pl. 35. f. 9, 10, hab. — ?; *undatus*, Chemn., p. 121, pl. 36. f. 7, 8, East Indies. The rest are well-known species.

Murex costulatus (Chiereghini, MSS.) is substituted for *Fusus hellerianus*, Brusina, 1864, = *Murex weinkauffianus*, Crosse, 1866. Brusina, Chiaregh. Conch. p. 153.

Murex gibbosus (Lam.). Weinkauff is inclined now to regard it as a variety of *M. erinaceus*, L. Bull. mal. Ital. iii. p. 80. It is figured by A. Manzoni from a fossil pliocene specimen, l. c. pl. 2. figs. 4, 5.

Murex erythræus, sp. n., Fischer, J. de Conch. xviii. p. 176, Red Sea; allied to *M. calcitrapa* (Lam.).

Murex pazi, Crosse, figured, J. de Conch. xviii. p. 99, pl. 1. fig. 4, West Indies, on deep-sea coral bottom.

Murex senegalensis, Lam., and *Turbinella muelleri*, Dunker, feeding on a species of *Cerithium*, the first making a hole in the shell, the other attacking it at the mouth, observed by Fr. Müller, Jen. Z. Nat. vi. p. 57, footnote.

Typhis duplicatus, sp. n., Sowerby, P. Z. S. 1870, p. 251, pl. 21. f. 1, China Seas.

[*Eupleura*] *Ranella caudata*, Say, the living animal described. Gould Invert. Mass. second edit. p. 387.

Trophon mærchii, Malm, = *Bela demersa*, Tiberi, has no operculum, and may constitute a new subgenus, *Taranis*. It has been found in Southern Norway and in the Mediterranean. Jeffreys, Ann. N. H. (4) v. p. 447.

[*Lachesis*] *Buccinum lefebrui*, Maravigna, 1840, = *B. areolatum*, Tiberi, = *Fusus granulatus*, Calcara, = *Lachesis folineæ*, Weinkauff (not Chiaje). Benoit & Aradas, Atti Soc. Ital. xii. p. 606.

PURPURIDÆ.

Rapa bulbiformis, sp. n., Sowerby, P. Z. S. 1870, p. 252, Tongataboo, Friendly Islands.

BUCCINIDÆ.

Buccinum tinei, Maravigna, belongs to *Nassa*, and is perhaps only a variety of *N. corniculum* (Olivi). Benoit & Aradas, Bull. mal. Ital. iii. p. 56. Weinkauff, on the contrary, admits it as a distinct species of the true genus *Buccinum*, allied to *humphreysianum*, ibid. p. 79.

Fusus ventricosus, sp. n., H. Adams, P. Z. S. 1870, p. 110, with a woodcut, l'Agulhas Bank, Cape of Good Hope.

**Fusus rubrolineatus*, sp. n., Sowerby, l. c. p. 252, Cape of Good Hope.

Metula trifasciata, sp. n., Sowerby, l. c. p. 254, Bay of Bengal.

NASSIDÆ.

Eburna perforata, sp. n., Sowerby, l. c. p. 252, pl. 21. fig 2, hab. — ?

Nassa reticulata (L.), its varieties in the North Sea and Mediterranean, including *cancellata*, Chemnitz, *tessulata*, Olivi, and *nitida*, Jeffreys, are discussed by E. v. Martens, Mal. Bl. xvii. pp. 86–88. Friedel is also inclined to reunite *nitida*, Jeffr., with *reticulata*, ibid. p. 75.

Nassa incrassata (Müll.), var. *sazatilis* (Chiereghini, MSS.), shortly characterized and *N. pygmæa* (Lam.) changed to *granulata* (Renier) [!] by Brusina, Chieregh. Conch. pp. 139 and 137.

Nassa gibbosula (L.), its occurrence in some parts of the Mediterranean defended. [The Recorder received it many years ago as found on the shore of Smyrna by Prof. Fleischer.]—*N. semistriata* (Brocchi) is admitted as a distinct recent species in the Mediterranean, and the name *N. pygmæa* (Lam.) changed to *varicosa* (Turt.), because the former is preoccupied. Weinkauff, Bull. mal. Ital. iii. pp. 77, 78.

Zeuxis clandestina, sp. n., A. Adams, Ann. N. H. (4) v. p. 426, Japan.

Cyllene gibba, sp. n., A. Adams, l. c. p. 427, Japan.

Cyllene rubrolineata, sp. n., Sowerby, P. Z. S. 1870, p. 251, hab. — ?

Volutharpa fischeriana, sp. n., A. Adams, l. c. p. 422, Korea Strait, South Japan.

OLIVIDÆ.

Oliva. Sowerby begins with part xxix. of his 'Thesaurus Conchyliorum' the monograph of this genus, publishing in fourteen plates (328–341 of the whole work) beautiful figures of about 90 species; the figures are of the natural size. This part contains no other letterpress than the explanation of the figures.

TURBINELLIDÆ.

Turbinella noumeensis, sp. n., Crosse, J. de Conch. xviii. p. 247, New Caledonia.

VOLUTIDÆ.

Voluta (Aulica) wisemani, sp. n., Brazier, P. Z. S. 1870, p. 108, islands on the north-east coast of Australia.

Voluta rueckeri, Crosse, comes from New Georgia Island, Solomon Archipelago; *Volutella tissotiana*, Crosse, from Northern Australia; *Alcithoe thatcheri*, M'Coy, from Bampton Reef, N.W. of New Caledonia. Brazier, l. c. pp. 85, 86.—*Voluta hamillei*, Crosse, figured, *ibid.* pl. 1. fig. 5, and pl. 2. fig. 1.

[*Voluta*] *Enata pederseui*, sp. n., and its next allied sp., *Lyria (Enata) cumingii* (Brod.) described by Verrill, Am. J. Sc. xix. p. 227, both from La Paz, California.

MITRIDÆ.

Mitra mediomaculata, *intersculpta*, and *corbicula*, Mauritius; *interstriata*, China Seas; *pratexta*, *dimidiata*, and *umbonata*, localities unknown, spp. nn. Sowerby, P. Z. S. 1870, pp. 255 and 258, 259.

Mitra (Cancilla) antoniae, sp. n., H. Adams, P. Z. S. 1870, p. 788, pl. 48. f. 1, Red Sea.

COLUMBELLIDÆ.

Columbella brisei (Chiereghini, MS.) is substituted for *C. nasuta* (Brusina, 1864, not Gmelin) by Brusina, Chieregh. Conch. p. 133.

Columbella costulata, Cantraine, = *testæ*, Aradas, 1847, = *haliaeti*, Jeff. Seguenza, Bull. mal. Ital. iii. p. 70.

MARGINELLIDÆ.

Marginella. 211 recent species enumerated by Redfield, Am. J. Conch. vi. Append. pp. 220-264. Several rectifications of synonymy by the same, l. c. pp. 172, 173.

Marginella obtusa, sp. n., Sowerby, P. Z. S. 1870, p. 252, hab. — ?

Volvaria, Lam. The type of this genus is the fossil *V. bulloides*, Lam.; the recent species are transferred to *Marginella* by Redfield, l. c. p. 263.

Erato. (See *Cypræidæ*.)

PROBOSCIDIFERA TÆNIOGLOSSA.

CASSIDIDÆ and RANELIDÆ.

Cassidaria tyrrhena (Chemn.), its distinctness from *echinophora* (L.), Weinkauff, Bull. mal. Ital. iii. p. 76.

[*Tritonium*] *Triton*. Küster's continuation of Chemnitz contains the beginning of a monograph of this genus, with 15 species, all described and figured with the same names by Reeve.

Triton lebbeckei, sp. n., Lischke, Mal. Bl. xvii. p. 23, Nangasaki; allied to *T. exaratus*, Reeve.

Ranella. Küster's monograph of this genus in the continuation of Chemnitz contains 38 species:—*R. sagitta*, sp. n., p. 147, pl. 38a. fig. 6, hab. — ?; *chemnitzii*, sp. n., p. 148, pl. 39. fig. 3, 4, copied from Chemnitz, 1860, 1861, hab. — ?; *svensonii*, Mörch, p. 157, pl. 38. fig. 3, copied from Chemnitz, fig. 1276. All the rest are species described and figured with the same

names in Reeve's monograph; Küster's descriptions and synonymy, however, are more copious.

CYPRÆIDÆ.

Cypræa. The monograph of this genus contained in Sowerby's 'Thesaurus Conchyliorum,' parts xxvi.-xxviii., contains, in 58 pages and 31 plates, descriptions and figures of 187 species, the latter of natural size. The genus is taken by the author in the old Linnæan sense, *Trivia* being made a subgenus; and there are besides seven subdivisions of *Cypræa* proper and two of *Trivia* adopted. Numerous notes, which serve chiefly to point out the distinction of closely allied species, are added to the descriptions.

It is severely criticised by H. Crosse, J. de Conch. xviii. pp. 254-260, where also several particulars concerning varieties or monstrosities of known species will be found.

Cypræa macandrei, sp. n., Sowerby, Thes. l. c. p. 52, pl. 37. f. 537, 538, Red Sea, and *C. castanea*, Higgins, *ibid.* p. 32, pl. 29. f. 302, 303, Cape of Good Hope.

Colpodaspis, gen. nov. Mich. Sars describes under this name a shell and its animal, found in the Christiania fjord at 14-80 fathoms, Bidr. Christian. Faun. pp. 70-74, pl. 11. figs. 1-6, which is probably, according to Jeffreys, the young state of *Cypræa europæa*, Mont., *ibid.* footnote p. 73.

Erato. Twenty recent species enumerated by Redfield, Am. J. Conch. vi. Appendix, pp. 215-219.

NATICIDÆ.

Lumatia heros (Say). The living animal figured, egg-case described, Gould, Invert. Mass. p. 339.

Colobocephalus, gen. nov. Testa subauriformis, tenuissima, submembranacea, epidermide inconspicua aut nulla; spira parva, sutura profunda; apertura amplissima, peristomate discontinuo; columella flexuosa; operculo nullo. Animal non omnino in testam recondendum; velo capitis sinuato sursum revolutum; tentaculis nullis; oculis 2 sessilibus in cervice, pede pedicellato, solea magna, oblonga, postice truncata, subtus sulco longitudinali medio; pallio supra testam non revolutum.—*C. costellatus*, sp. n., Sars, Bidr. Christian. Faun. pp. 54-57, pl. 11. figs. 7-14, Drobak and Vallö, near Christiania, 200-230 fathoms. The author compares it with the *Bullidæ*; Jeffreys thinks it allied to *Bullus smithii* (Brown)=*Natica aperta*, Lovén, *ibid.* footnote.

PROBOSCIDIFERA PTENOGLOSSA.

SOLARIIDÆ.

Solarium archita, Costa, distinct from *S. fallaciosum*, Tiberi,=*stramineum* Philippi, Jeffreys, Ann. N. H. (4) vi. p. 458.

Architea, gen. nov. Testa turbinata, parum elevata, infra late et profunde umbilicata; apertura rotundata, peristomate continuo, simplice. Operculum corneum, pellucidum, spirale, extus planum, intus spira ad centrum parum prominula.—*A. catenulata*, sp. n., Naples, Costa, Ann. Mus. Nap. iii. 1869, with figures.

PROBOSCIDIFERA GYMNOGLOSSA.

PYRAMIDELLIDÆ.

Pyramidella leviuscula, S. Wood, = *plicosa*, Bronn, which has priority,

found in recent state near Tunis. Jeffreys, Ann. N. H. (4) vi. p. 79, and Weinkauff, Bull. mal. Ital. iii. p. 97.

Mormula macandree, sp. n., A. Adams, Ann. N. H. (4) vi. p. 127, Gulf of Suez. To this genus belong also:—*Lancea*, sp., Pease; *Pyramidella actis*, A. Adams; *P. ambigua*, Gould; and probably *Proto cornelliana*, Newcombe (see Zool. Rec. vi. p. 552). A. Adams, l. c.

Odostomia craticulata (Renier, MS.), *humboldti* (Risso)=*striata*, Danilo e Sandri,=*humb.* var. *elongata*, Tiberi, J. de Conch. 1868, and *O. kusmici*, new name for *humboldti*, var. *subventricosa* (Philippi)=*humboldtii*, Tiberi. Brusina, Chieregh. Conch. pp. 208–211.

Odostomia erjaveciana, Brusina, 1869,=*turriculata*, Allery, 1869, and, perhaps, rather belongs to the genus *Eulimella*; *O. vitrea*, Brusina,=*neglecta*, Tiberi, 1868,=*elegans*, Allery, 1869, belonging to the section *Auriculina*, both in the Mediterranean. Brusina, Bull. mal. Ital. iii. pp. 10, 11.

Odostomia nitens, sp. n., Jeffreys, Ann. N. H. (4) vi. p. 79, Ægean Sea.

Turbonilla candida and *rugosa*, spp. nn., Folin, Fonds de la Mer, pp. 207, 208, pl. 28. f. 13, and pl. 29. fig. 5, Western Africa.

Turbonilla macandree, new name for *T. speciosa*. H. Adams, P. Z. S. 1870, p. 793.

Jaminea bilirata, sp. n., Folin, l. c. pl. 29. f. 3, Western Africa.

Ondina sulcata, sp. n., Folin, l. c. pl. 29. f. 1, Western Africa.

Syrnola lucida, sp. n., A. Adams, Ann. N. H. (4) vi. p. 125, Gulf of Suez.

Orina, gen. nov. Testa vitrea, conico-turrita, umbilicata; anfr. planis, simplicibus. Apertura subquadrata, plica parietali unica transversa instructa. *O. pingicula*, sp. n., A. Adams, l. c. p. 126, Gulf of Suez.

Styloptygma nivea, sp. n., A. Adams, l. c. p. 126, Gulf of Suez.

Agatha vitrea, sp. n., A. Adams, l. c. p. 127, Gulf of Suez.

Mathilda elegans and *splendida*, spp. nn., Folin, Fonds de la Mer, pp. 212, 213, pl. 28. f. 15, and pl. 29. f. 6, Western Africa.—*M. epicharis*, sp. n., Folin, l. c. p. 219, pl. 29. f. 8, Pointe à Pitre.

Chemnitzia constricta, sp. n., Folin, l. c. p. 190, pl. 26. f. 9, Vera Cruz.

Eulimella polita, *carinata*, *tenuis*, *levissima*, *striata*, *obtusa*, and *variabilis*, spp. nn., Folin, l. c. pp. 208–211, pl. 28. figs. 5, 7–12, Western Africa.—*E. striatula*, Jeffr. 1856, changed into *hyalina*. Jeffreys, Ann. N. H. (4) vi. p. 79.

EULIMIDÆ.

Eulima incurva (Renier, MS.)=*philippii*, Weinkauff. Brusina, Chieregh. Conch. p. 213.

STYLIFERIDÆ.

Scalenostoma deshayesi, sp. n., A. Adams, Ann. N. H. (4) vi. p. 128, Gulf of Suez. The author thinks that this genus belongs to the Styliferidæ, and probably includes also *Chemnitzia rangii*, Folin.

Styliferina callosa, sp. n., A. Adams, l. c. p. 124, Gulf of Suez. The author thinks this genus more nearly allied to *Alaba* than to *Stylifer*.

TOXIFERA.

CONIDÆ.

Conus cooki and *rossiteri*, spp. nn., Brazier, P. Z. S. 1870, p. 109, both 1870. [VOL. VII.]

from Botany Bay.—*C. suffusus*, New Caledonia; *turritus*, Agulhas Bank; *floridensis*, Florida; *tegulatus*, *gemmulatus*, and *rarinaculatus*, China seas; *laterculatus*, *submarginatus*, *planiliratus*, *tenuisulcatus*, *corrugatus*, and *semi-sulcatus*, localities unknown, spp. nn.; *mitræformis*, var. *pupæformis*, Mauritius; and *sowerbyi*, Reeve, var. *subæqualis*, China seas, varr. nn. Sowerby, P. Z. S. 1870, pp. 255–257, pl. 22. fig. 1–14.

PLEUROTOMIDÆ.

Pleurotoma modiolus, Jan, 1832, Bellardi, 1847,=*acuta*, Bellardi, 1842,=*carinata*, Philippi, 1844, Jeffr. 1869. Seguenza, Bull. mal. Ital. iii. p. 70.

Pleurotoma mörchii, Malm, Christiania-fjord. The living animal described. Sars, Bidr. Christ. faun. p. 51.

Pleurotoma bivonæ, Maravigna,=*attenuata* (Mont.), *bivoniana*, Mar.,=*multilineolata*, Desh.; *Pl. kieneri*, Mar.,=*Bela rufa* (Mont.); *Pl. valenciennesi*, Mar.,=*Pl. payraudeani* (Phil.); *Pl. petiti*, Mar.,=*scalina*, Phil. Benoit et Aradas, Atti Soc. Ital. xii. pp. 602–604.

Defrancia reticulata (Renier). Brusina substitutes for this name *D. craticulata*, Olivi [nec Linn.], Chiaregh. Conch. p. 160.

Pleurotoma latifasciata, Hong Kong, *laterculata*, China seas, and *albicarinata*, Manzanilla, spp. nn., Sowerby, P. Z. S. 1870, p. 253.

Clavatula tumida, Agulhas Bank, and *gracilior*, spp. nn., Sowerby, l. c. pp. 253, 254.

Defrancia hystrix, Jan, its distinctness from *reticulata*, var. *formosa*, Forb., admitted by Jeffr. Ann. N. H. (4) vi. p. 82 (see Zool. Rec. vi. p. 546).

Defrancia secta, sp. n., Sowerby, l. c. p. 254, China.

Mangelia coarctata, Forbes, is a variety of *costata*, Penn.; *M. cærulans*, Phil., is regarded as a variety of *vauguelinii*, Payr. Weinkauff, Bull. mal. Ital. iii. p. 85.

Mangelia clavata, sp. n., Sowerby, l. c. p. 254, China seas.

Conopleura, Hinds. *Pleurotoma elegans*, Scacchi, is transferred to this genus by Jeffreys, Ann. N. H. (4) xvi. p. 83.

TEREBRIDÆ.

Terebra tenuisculpta, sp. n., Sowerby, P. Z. S. 1870, p. 252, China seas.

ROSTRIFERA (*Tænioglossa*).

STROMBIDÆ.

Strombus mirabilis, sp. n., Sowerby, l. c. p. 257, pl. 21. fig. 4, Ceylon, allied to *vittatus* (L.).

Simpulum lirostoma, *papillosum*, *nodiliratum*, *trianga*, spp. nn., A. Adams, Ann. N. H. (4) v. pp. 419, 420, Japan.

Cabestana dorsuosa, sp. n., A. Adams, l. c. p. 420, Japan.

Epidromus reticosus, sp. n., A. Adams, l. c. p. 420, Japan.

PHORIDÆ.

Xenophora robusta, sp. n., Verrill, Am. J. Sc. xix. p. 226, La Paz, California.

OVULIDÆ (AMPHIPERASIDÆ).

GILL insists that the nearest relations of this family are with *Pedicularia*, and proposes to restore for them both the suborder *Digitoglossa*, originally proposed by J. E. Gray. Am. Journ. Conch. vi. pp. 182-187. There is nothing essentially new in this paper.

CERITHIIDÆ.

Cerithium brongniartii, Marav., = *hymerensis*, Calcare; the first has one month's priority. Benoit and Aradas, Att. Soc. Ital. xii. p. 602.

Cerithium metula, Lovén, the first whorls longitudinally ribbed, and wanting the granulate spiral girdles. Sars, Bidr. Christ. faun. p. 59.

Cerithium trilineatum, Phil. The embryonic whorls are peculiarly formed; it does not belong to *Cerithiopsis*. *C. metaxa* (Chiaje) is not *crosseanum*, Tiberi, but a variety of *scabrum* (Oliv). Weinkauff, Bull. mal. Ital. iii. p. 88.

Triforis benoitiana, sp. n., Aradas, Atti Soc. Ital. xii. pp. 549, 550, and Bull. mal. Ital. iii. p. 537, Aci Trezza in Sicily. Weinkauff thinks that it is only a variety of *scabrum* (Oliv), l. c. p. 88.

Triphoris [*Triforis*] *similis*, *minimus*, *pallidus*, *sulcosus*, *gracilis*, *perfectus*, *oryza*, *pustulosus* and *annulatus*, from Kauai, Sandwich Islands; *punctatus* and *costatus*, Annaa; *robustus*, Makaimo; *cylindricus* and *brunneus*, Apaiang; *granosus*, Tahiti, spp. nn., Pease, P. Z. S. 1870, pp. 774-777.

MELANIIDÆ.

Brot enumerates 332 recent species of *Melania*, 14 of *Doryssa*, 10 of *Vibex*, 16 of *Pirena*, 32 of *Hemisinus*, 3 of *Clea*, 4 of *Canidia*, 44 of *Melanopsis*, and 32 of *Paludomus*. He persists in uniting under the name *Hemisinus* very unlike species from different parts of the world, taking the European *esperi*, Fér., away from its nearest ally *Melanopsis acicularis*, Fér. Am. J. Conch. iv. App. pp. 271-325.

Paludomus reticulata, sp. n., Blanford, J. A. S. B. xxxix. p. 9, pl. 3. fig. 1, Cachar, India.

Melania potamobia, sp. n., Bourguignat, Ann. Mal. p. 44, mouth of the Danube.

[*Melania*] *Melanoides swinhoei*, sp. n., H. Adams, P. Z. S. 1870, p. 8, pl. 1. f. 12, Hainan.

[*Melania*] *Melaniella brevicula*, sp. n., H. Adams, l. c. p. 379, pl. 27. fig. 12, Amoy, China.

Melania plicatilis, sp. n., *ovalana*, new name for *perpinguis* (Gould, nec Hinds, nec Reeve), with 2 new varieties, *subexusta*, sp. n., with 2 new varieties, and *turritelloides*, sp. n., with remarks on some other species. Mousson, J. de Conch. xviii. pp. 203-216, Fiji Islands.

Melania kaniensis and *contigua*, spp. nn., Pease, Am. J. Conch. vi. p. 7 (the first figured pl. 3. fig. 6), Sandwich Islands.

Pachychilus jansoni, sp. n., H. Adams, l. c. p. 795, Nicaragua.

Melanopsis curta, *zonites*, *robusta*, *fusca*, *fusiformis*, and *souverbiana*, spp. nn., Gassies, J. de Conch. xviii. pp. 146-148, New Caledonia.

Melanopsis dufourei (Fér.), its occurrence in Tuscany, where it has been observed for about ten years, confirmed by F. L. Appellius, Nachr. mal. Ges. pp. 44-46.

LITTORINIDÆ.

Littorina saxatilis, Olivi, Zool. Ad. 1792, p. 172 (not Johnston), = *rudis*, Mont. Brusina, Chiareghinii Conchylia, pp. 190–192, 236 & 237.

Cremnocoenochus conicus, sp. n., Blanford, J. A. S. B. xxxix. pp. 10–12, pl. 3. figs. 3–5, Poona, British India.

*Hela**, gen. nov. Shell and operculum like *Lacuna*, but no epidermis; a narrow chink instead of the umbilical groove; apex flattened; tentacles ciliated. Type *Lacuna tenella* (Jeffr.), Jeffreys, Ann. N. H. (4) vi. p. 76, Mediterranean.

PLANAXIDÆ.

Diala succincta, sp. n., A. Adams, Ann. N. H. (4) vi. p. 124, Gulf of Suez.—*Monoptygma suturalis*, Sow., belongs also to this genus.

RISSOIDÆ.

Manzonina, new name proposed by Brusina for a section of *Rissoa*, which is distinguished by its double peristome; it comprises the *R. zetlandica* (Mont.), *costata* (Adams), *macandrei* (Manzoni), to which is added by Brusina *M. clathroides*, sp. n. (*Turbo clathroides*, Chiareghini's MS.), from the sediment of the Adriatic. Brusina, Chiaregh. Conch. p. 201.

Alvania weinkauffi, Schwartz, not identical with *zetlandica* (Mont.), but with *dictyophora* (Phil.). Weinkauff, Bull. mal. Ital. iii. p. 132.

Rissoa lancia, Calcare, 1845, = *philippiana*, Jeffreys, 1856. Allery de Monterosato, Bull. mal. Ital. iii. p. 45.

Rissoa anethystina (Renier, figured in 1807), name substituted for *R. violacea*, Desmarest, 1824, by Brusina, Chiaregh. Conch. p. 205.

Rissoa eximia, Jeffr., *Chemnitzia clathrata*, Forb. & Hanl., united with it by Sars, Bidr. Christ. faun. p. 60.

Rissoa turgida, sp. n., Jeffreys, Ann. N. H. (4) v. p. 445, Dröbak and Vallö in Christiania-fjord, from 40 to 100 fathoms.

Rissoa abyssicola, Forb., some varieties from the Mediterranean indicated by Jeffreys, Ann. N. H. (4) vi. p. 76.—*R. philippiana*, var. *tessellata* (Schwartz), Jeffr. *ibid.* p. 77.

Rissoa gracilis, sp. n., A. Adams, Ann. N. H. (4) vi. p. 122, Gulf of Suez.

Corena, gen. nov., with double peristome and the inner lip furnished posteriorly with a dentiform tubercle.—*C. tuberculifera*, sp. n., A. Adams, *l. c.* p. 122, Gulf of Suez. Near *Onoba*.

Cingula schlosseriana, sp. n., Brusina, Bull. mal. Ital. iii. p. 9, Palermo.

Hyala nitida, *concinna*, and *pumila*, spp. nn., A. Adams, *l. c.* p. 123, Gulf of Suez; the last also from Japan.

Ceratia pyrgula, sp. n., A. Adams, *l. c.* p. 121, Gulf of Suez.

Microstelma concinna, sp. n., A. Adams, *l. c.* p. 121, Gulf of Suez.

Hydrobia. E. de Betta, Malacol. Venet. pp. 93, 94, & 127, enumerates four species belonging to this genus, which live in the estuaries of Venice, viz. *conoidea*, Reynier, *stagnalis*, Baster, *thermalis*, Linné, and *ventrosa*, Montagu; it is probable that they all belong to one species. He is also wrong in associating all those species with spiral operculum in the genus *Bithynia*.

* Preoccupied in Crustacea, 1861.

Hydrobia acuta (Drap.) again found, but not alive, in the salt lake near Halle, and the probability that it may really live there discussed by the Recorder, SB. nat. Fr. 1870, p. 59.

"*Bithynia stagnalis*," Baster, one of the *Hydrobiæ* living in the province of Verona, is considered [probably wrongly] to be identical with the sub-marine *H. stagnalis*, Linné; the Veronese species determined by Menegazzi as *abbreviata*, Mich., is really *schmidtii*, Charp. Betta, Moll. prov. Veron. pp. 110-112.

Hydrobia paladilhi, sp. n., Dubreuil, Ann. mal. Belg. iv. (1869) p. xlii, with a woodcut, Rivière de Lamalou, tributary of the Hérault, S. France.

Amnicola penchinati, sp. n., Bourguignat, Ann. Mal. p. 37, mouth of the Danube.

Amnicola vindilica, sp. n., Paladilhe, Ann. Mal. p. 37, France.

Paludinella eurystoma and *amianensis*, spp. nn., Paladilhe, l. c. p. 200, France.

Paludestrina tetrospoides and *brevispira*, spp. nn., Paladilhe, l. c. p. 210, France.

Belgrandia bourguignati, sp. n., St. Simon, Ann. Mal. p. 20, France.

Pyrgula annulata, Jan. Betta, Moll. prov. Veron. pp. 126-128, discusses the specific name of this shell, but without knowing that it has been formally described and figured by Megerle von Mühlfeld (Verh. d. Ges. natur. Fr. Berl. vol. i. 1824, p. 215, pl. 9 (3) f. 5) as *Turbo annulatus*, Gmelin. Gmelin's species, however, seems different.

Lithoglyphus penchinati, sp. n., Bourguignat, Ann. Mal. p. 40, mouth of the Danube.

Lithoglyphus martabanensis, sp. n., Theobald, J. A. S. B. xxxix. p. 402, Martaban. Operculum horny. [The author does not say whether it is spiral or concentric; the shell looks rather like some species of *Paludomus*.]

Tricula montana, Bens., is a true freshwater shell; its tentacles are long, filiform, and the eyes placed behind them, just as in the terrestrial *Acicula*, Hartm.; it has been refound in North Cachar, at an elevation of about 3000 feet above the sea. Blanford, Ann. N. H. (4) vi. p. 369.

PALUDINIDÆ.

The *Paludinidæ* of France, including *Hydrobia* &c., are reviewed by Paladilhe, Ann. Mal. pp. 167-243.

Paludina pyramidalis, Jan, acknowledged as a variety of *fasciata*, Müll., *atra*, Jan, maintained as a species; the former in different valleys of the province of Verona, the latter only in the lake of Garda. Betta, Moll. prov. Veron. p. 121.

Vivipara penchinati, *subfasciata*, *danubialis*, *amblya*, and *microlena*, spp. nn., Bourguignat, Ann. Mal. p. 37, mouth of the Danube.

Vivipara lineata (Küster not Val.) is the true name of the American species; the occurrence of Valenciennes's specimens in India is attested by a MS. label in the Museum of Paris. Binney, Ann. Lyc. N. York, ix. pp. 295-297, and Tryon, Am. Journ. Conch. vi. p. 176. [The Recorder made the same statement in 1865 (Mal. Bl. xii. p. 150).]

Tulotoma magnifica (Conrad), its lingual dentition described and figured by Binney and Bland, Ann. Lyc. N. York, ix. pp. 292-294: it is very similar to that of *Vivipara*; also the right tentacle is said to be broad [probably only in the males, as in *Vivipara*].

Grayana, new subgeneric name for the true *Bithynia*, Gray. Betta, Moll. prov. Veron. p. 113 [*Elona*, Moq.-Tand. 1855, is identical].

Bithynia nassa, Theobald, 1863, redescribed and figured by the author, J. A. S. B. xxxix. p. 402, pl. 18. f. 8.

Bithynia robusta, sp. n., H. Adams, P. Z. S. 1870, p. 8, pl. 1. fig. 13, Hainan.

VALVATIDÆ.

Valvata naticina, Menke. Hensche insists that he has found and recognized this species in the province of Eastern Prussia. Nachr. mal. Ges. ii. p. 98. The Recorder has also recognized it, on comparison with Hensche's specimens, in a *Valvata* collected by Dr. Jachno in Galizia, and supposes it to be the *Valvata*, sp. n., from Kiew and Moskau, in Nadeschin's catalogue, l. c. pp. 131 and 181.

Valvata fluviatilis, sp. n., Colbeau, Ann. mal. Belg. iii. 1868, p. 93, pl. 2. fig. 16, Belgium. [Probably = *contorta* (Menke, 1849, not Müll.) = *antiqua* (Morris, 1846, teste Mörch, 1864).]

Valvata tasolana, sp. n., St. Simon, Ann. Mal. p. 22, France.

Valvata coronadoi, sp. n., Bourguignat, R. Z. 1870, p. 168, Madrid; very small.

Valvatina and *Planorbina*, new names for the sections of the genus *Valvata*, comprising *V. piscinalis*, Müll., and *V. cristata*, Müll., respectively. Betta, Moll. prov. Veron. p. 127. [The first = *Cincinna*, Hübn., Mörch, 1864; the second = *Gyrorbis*, Fitz. 1837, and *Planella*, Schlüter, 1838.]

Phaneta, gen. nov. Testa imperforata, trochiformis, spiræ anfractibus paucis, ultimo carinato, expanso, basi depresso; apertura ampla, rotundata, antice subsinuata, intus margaritacea; columella revoluta, acuta; peristoma simplex, rectum. *P. everetti*, sp. n., Siniwan river, Borneo. H. Adams, P. Z. S. 1870, p. 793, pl. 48. f. 20.

AMPULLARIIDÆ.

Ampullaria wernei, Philippi. Frequent and of large size in the Bahr-el-gazal system of the White Nile, found by G. Schweinfurth; its differences from *A. speciosa*, Phil., pointed out by Martens, Mal. Bl. xvii. p. 34.

TURRITELLIDÆ.

Turritella subangulata, Brocchi, recent in the Mediterranean; specimens sent by Benoit to Weinkauff. Bull. mal. Ital. iii. p. 134.

Turritella excavata and *puncticulata*, spp. nn., Sowerby, P. Z. S. 1870, pp. 262, 263, both from Agulhas Bank.

Protoma, gen. nov. Testa turrita; apertura ovalis, labro inferiore acute inciso. Operculum circulare, corneum, multispirale. *P. knockeri*, sp. n., Baird, P. Z. S. 1870, pp. 59, 60, with a woodcut, Whydah, W. Afr. Baird adds that some fossil species placed commonly in the genus *Proto* may possibly enter into his new genus, but not *P. maraschii*, and moreover that the name has been twice preoccupied.

CÆCIDÆ.

Cæcum veracruzianum, *vestitum*, *carmenense*, *buccina*, *bipartitum*, *contractum*, *instructum*, *abbreviatum*, and *triornatum*, spp. nn., Folin, Fonds de la Mer, part xii. et xiii. pp. 183-187, pl. 25. figs. 1-16, and pl. 26. f. 1 & 2, Vera

Cruz and Carmen. *C. senegambianum*, *crassum*, and *vicinum*, spp. nn., *l. c.* pp. 206, 207, pl. 28. figs. 1-6, Western Africa.

Meioceras fischeri and *imiklis* [sic], spp. nn., Folin, *l. c.* pp. 188, 189, pl. 26. figs. 3, 4, & 5, 6, Vera Cruz and Carmen.

Parastrophia asturiana, sp. n., Folin, *l. c.* p. 218, pl. 29. f. 7, Gulf of Gascony.

CALYPTRÆIDÆ.

Calyptrea [*Crucibulum*?] *spirata*, Nardo, = *Patella neritoidea* (Olivi, not Linné) = *Cal. höberti*, Parreyss in litt., rare in the Adriatic, fixed on other shells. Brusina, Chiaregh. Conch. p. 244.

CAPULIDÆ.

Capulus shreevei, Conrad (Zool. Rec. vi. p. 553), recognized to be the inner tooth of *Pholas costata* (L.) by the author himself. Am. J. Conch. vi. p. 71.

Amathina trigona, sp. n., Sowerby, P. Z. S. 1870, p. 251, Tongataboo.

FAMILY UNCERTAIN.

Caledoniella montrousieri (Souv.) and *Lambertia montrousieri* (Souv.) re-described and figured. Soubervie, J. de Conch. xviii. pp. 71, 72, pl. 9. figs. 4 and 5.

Karolus, gen. nov. Testa subcylindrica, subelongata, apice obtusissimo; apertura subpiriformi, ad columellam interrupta, ad angulum superiorem labro expanso intus penetrante subcanaliculata; columella truncata.—*K. primus*, sp. n., Folin, *l. c.* pp. 182 and 189, pl. 25. figs. 7, 8, Vera Cruz: $2\frac{1}{2}$ mill. long.; five whorls. No suggestion is given by the author as to the systematic position of this genus.

SCUTIBRANCHIATA.

PODOPHTHALMA.

NERITIDÆ.

Neritina. Besides *N. fluviatilis* the following are maintained as distinct species living within the province of Verona:—*rhodocolpa*, Jan, including as a variety *intexta*, Villa; *trifasciata*, Menke; *serratilinea*, Ziegl., and *danubialis*, Ziegl.; *rhodocolpa* and *danubialis* live in the lake of Garda, the others in different streams. Betta, Moll. prov. Veron. pp. 129-131.

Neritina mobosa [morbosa?], *pauhucciana*, and *lenormandi*, spp. nn., Gassies, J. de Conch. xviii. pp. 149, 150, New Caledonia.

Neritina (*Clypeolum*) *frondosa*, *garretti*, and *deltioidea*, spp. nn., Mousson, J. de Conch. xviii. p. 221, Fiji Islands.

Navicella excelsa, sp. n., Gassies, *l. c.* p. 150, New Caledonia.—*N. schmeltziana*, sp. n., and *freycineti* (Récluz), var. *vitiensis*, Mousson, *l. c.* pp. 227 and 225, Fiji Islands.

TROCHIDÆ.

Phasianella tenuis, Mich., = *pulla*, auct., and *P. crassa*, Brusina, 1864, is the true *pulla* (L.). Brusina, Chiaregh. Conch. pp. 197, 198.

Discopsis, gen. nov. "Testa discoidea, valde depressa, umbilicata, apertura valde obliqua, margines super penultimum anfractum canali incrassato

uncti."—*D. omalos*, Pointe à Pitre, and *costulatus*, Western Africa. Folin, Fonds de la Mer, parts xii. and xiii. pp. 190 and 205, pl. 23. figs. 6, 7, and pl. 29. f. 4.

Elenchus dilatatus, sp. n., Sowerby, P. Z. S. 1870, p. 251, New Zealand.

Solariella undata, sp. n., Sowerby, l. c. p. 251, Agulhas Bank.

Trochus turbinatus, Born, *articulatus* (Lam.), *divaricatus* (L.), *minutus* (Chemn.), and *conulus* (L.), animals described by Deshayes, Ann. Mal. i. pp. 6–19.

Trochus (Trochocochlea) draparnaudii (Payr.). For this the name *Mondonta aglietti* (Renier, MS.) is substituted by Brusina, Chiaregh. Conch. p. 179.

Trochus duminyi, Requier, = *Solarium philippii*, Cantraine, = *T. zonatus*, Jeffr., its systematic place doubtful, the operculum being that of *Trochus*, but the shell is not at all pearly. Jeffreys, Ann. N. H. (4) vi. p. 458.

Stomatella (Gena?) crassa, sp. n., Montrouzier, J. de Conch. xviii. p. 74, pl. 9. fig. 6, Art Island.

Microtina heckeliana, sp. n., Crosse, J. de Conch. xviii. p. 138, New Caledonia.

Scissurella crispata (Flem.). The living animal described, and *S. angulata* (Lovén) stated to be a large variety of the same, by Jeffreys, Ann. N. H. (4) v. p. 444.

Haliotis adriatica, sp. n. (Chiareghini, MS.), Brusina, Chiaregh. Conch. p. 244, Adriatic.

Haliotis supertexta, sp. n., Lischke, Mal. Bl. xvii. p. 24, Nangasaki.

EDRIOPTHALMA.

FISSURELLIDÆ.

Fissurisepta papillosa, Seguenza. Before only known as a miocene fossil, dredged at Dröbak, in Christianiafjord, by Jeffreys. Ann. N. H. (4) v. p. 443.

Nesta, gen. n. Allied to *Zeidora*, but without internal septum. *N. candida*, sp. n., H. Adams, P. Z. S. 1870, p. 5, pl. 4. fig. 1. Red Sea. [The distinctness from a true *Emarginula* is not apparent.]

Scutus and *Tugalia*. Sowerby's monograph of these genera in the continuation of Reeve's 'Conchologia Iconica,' vol. xvii., contains five species on two plates of the former, and seven species on one plate of the latter.

CYCLOBRANCHIATA.

W. H. DALL has reviewed the systematical arrangement of *Patella* and allied genera, and establishes the following classification of them, Am. J. Conch. vi. pp. 227–237 and 265:—

Order DOCOGLOSSA, Troschel.

Suborder I. ABRANCHIATA. No gills. Only one family: *Lepetidae*. (See Zool. Rec. vi. p. 556.)

Suborder II. PROTEOBRANCHIATA. Gills present, in various forms.

Fam. 1. *Acmaeidae*. A cervical plume-like gill. Rhachidian tooth rarely present, lateral teeth invariably three in number. Genera: *Acmaea*, *Lottia*, *Scurria*.

Fam. 2. *Patellidae*. Gills forming a row of leaflets surrounding the body. No cervical plume-like gill. Genera: *Ancistromesus*, *Patella*, *Patinella*, *Nacella*, *Helcion*, *Helcioniscus*, and *Patina*.

TECTURIDÆ.

Acmaea, Eschscholtz. This genus is subdivided by Dall, Am. J. Conch. vi. pp. 237-260, in the following manner:—

Acmaea, Esch. Type *A. mitra*, Esch.

Collinella, subg. n. Lateral teeth unequal, muzzle-frill simple.

Sect. a. One uncinus: *C. pelta* (Esch.), *patina* (Esch.), *testudinalis* (Müll.), *persona* (Esch.), *spectrum* (Reeve), *scabra* (Reeve), *asmi* (Midd.), *mitella* (Menke), *strigatella* (Carpenter), *fascicularis* (Menke), *paleacea* (Gould), *atrata* (Carp.), *pediculus* (Phil.), *subrugosa* (Orb.), and *araucana* (Orb.); the dentition of all these, except *paleacea* and *araucana*, figured pl. 14. figs. 4-15, and pl. 15. fig. 16.

Sect. b. *Collinsellina*. Two uncini: *C. saccharina* (L.) and *borneensis* (Reeve); dentition of both figured pl. 15. f. 17 and 18.

Acmaea sybaritica, sp. n., Dall, l. c. p. 257, pl. 17. f. 34, Behring's Strait, in deep water; *A. hierosolymitana*, sp. n., Dall, l. c. p. 258, pl. 17. f. 37, China. Both belong probably to the first section of *Collinella*.

Acmaea concinna, sp. n., and *A. schrenckii* (Lischke) redescribed, Lischke, Mal. Bl. xvii. p. 25, both from Japan.

Lottia, Gray. This genus is distinguished by the presence of a branchial cordon around the posterior half of the body, continuous behind, and reaching forwards as far as the shell-muscle, besides the cervical gill. Dentition of *Lottia gigantea*, Sow., described and figured. Dall, l. c. p. 260, pl. 15. f. 20.

Scurria, Gray. This genus has also besides the cervical gill an accessory branchial cordon, which goes round the body as in *Patella*. Type *S. scurra* (Less.)=*pallida* (Sow.). To this genus belong also *mesoleuca*, Menke, pl. 15. f. 19, and probably also *zebrina*, Less. Dall, l. c. p. 262.

PATELLIDÆ.

Ancistromesus, gen. nov., Dall, l. c. p. 266. A simple rhachidian tooth; two inner lateral teeth on each side anterior to the third, which is large and quadridentate. Uncini simple. *A. mexicanus* (Brod. and Sow.); dentition figured pl. 16. f. 21.

Patinella, gen. nov., Dall, l. c. p. 272. Sides of the foot provided with scalloped lappets. Teeth 3 (2-1. 1-2) 3. Inner uncinus plate-like, without a cusp. *P. magellanica* (Gmel.)=*decurata* (Gmel.)=*ferruginea* (Wood); dentition figured pl. 15. f. 24.

Nacella, Schum. This genus also has scalloped lappets on the sides of the foot. The second and the third lateral teeth are large and subequal. *N. mytilina* (Gmel.)=*conchacea* (Gmel.)=*mytiloides* (Schumacher)=*cymbularia* (Lam.), common on floating fuci near Cape Horn. Dall, l. c. p. 274; dentition pl. 16. fig. 2.

Helcioniscus, gen. nov., Dall, l. c. p. 277. Inner uncinus hardly raised above the level of the ribbon; second lateral tooth largest. Sides of the foot smooth. *H. variegatus* (Reeve), *rota* (Reeve), and *exaratus* (Nuttall)=*sandwicensis* (Pease); dentition of all three figured pl. 16. figs. 27-29.

Patella pentagona (Born?, Reeve) = *stellaeformis* (Reeve) = *cretacea* (Reeve) = *paumotensis* (Gill), from the Polynesian Islands, its dentition agreeing with that of *P. vulgata* (L.). Dall, l. c. p. 272, pl. 15. figs. 22 & 23.

CHITONIDÆ.

Chiton (L.). An account of L. Spengler's monograph (1794) is given by Mörch, Mal. Bl. xvii. pp. 110-113.

Chiton siculus, Gray, varieties in colour; *Ch. euplaceæ*, Costa, is a variety of *polii*, Phil.; *Ch. meneghinii*, Capellini, is a variety of *rissoi*, Payr., which is very variable also in the number of the teeth of the apophyses; *Ch. variegatus*, Phil., described; *Ch. philippii*, new name for *pulchellus*, Phil. (pre-occupied). Issel, Bull. mal. Ital. iii. pp. 1-9, pl. 1. figs. 1 (*Ch. variegatus*), 2 & 3 (juvenile state and varieties of *Ch. rissoi*).

Chiton estuari (Chiareghini, MS.) "appears to be a good species," Brusina, Chiaregh. Conch. p. 45, Chioggia near Venice.

TECTIBRANCHIATA.

TORNATELLIDÆ.

Ringicula moritzii, sp. n., Folin, Fonds de la Mer, p. 212, pl. 28. fig. 14, Cagnabac, Western Africa.

Actæon exilis, sp. n., Jeffreys, Ann. N. H. (4) vi. p. 85, Mediterranean.

BULLIDÆ.

Volva acuminata, Brug. Shell and living animal described by Sars, who believes it to belong to the genus *Volva*, A. Adams. Tentacula separata, foliacea, elongata, apice obtuso rotundato; oculi minuti; solen nec lateraliter nec postice expansus. Bidr. Christ. faun. pp. 62-64, pl. 11. figs. 19-22. Jeffreys thinks that it does not essentially differ from *Cylindna*, *ibid.* footnote, and Ann. N. H. (4) v. p. 448.

Bullina, Fér. Sowerby's monograph in Reeve's Conchologia Iconica, parts 284, 285, contains 5 species of this genus on 1 plate.

Utriculus, Brown, = *Amphisphyra*, Lovén, 6 species figured by Sowerby on 1 plate. [*U. cecillei* should be cited as "Philippi, Zeit. f. Mal. 1844, p. 164, China."]

Utriculopsis, gen. nov. Allied to *Haminea*, but without eyes, and without the two hinder lobes of the cephalic disk; the lateral lobes of the foot are short, and seem not to cover the shell; no hinder lobe or metapodium.—*U. vitrea*, sp. n., Sars, Bidr. Christ. faun. pp. 65-68, pl. 11. figs. 15-18, Fjord of Christiana, 30-300 fathoms. Jeffreys thinks it is identical with *Utriculus globosus* (Lovén), the spire being visible in the young, but nearly concealed in the full-grown animal, Ann. N. H. (4) v. p. 448. G. O. Sars insists on the generic difference from *Utriculus*, footnote, p. 65.

Scaphander. Sowerby figures six species of this genus in Reeve's Conch. Icon.

Philina. Sowerby's monograph in Reeve's Conchologia Iconica, parts 284, 285, figures 13 species. *Ph. truncatissima*, sp. n., pl. 1. f. 5, and *orientalis*, A. Adams, MS., pl. 2. f. 11, locality not indicated.

Philine flexuosa, sp. n., Sars, Bidr. Christ. faun. p. 70, Aasgaardstrand in the fjord of Christiania, 20-30 fathoms; *Ph. lovenii*, Malm, is perhaps only a variety of *scabra*, Müll., and *Ph. quadrata*, Wood, the animal described, *l. c.* pp. 68, 69; *Ph. sinuata*, Stimps., *quadrata*, S. Wood, and *lineolata* (Couth.). Gould, Invert. Mass. 2nd edit. pp. 213, 214, with woodcuts, Massachusetts.

Linteria. Sowerby's monograph in Reeve's Conchol. Icon. contains 6 species. *L. acuminata*, sp. n., fig. 2, Guadeloupe, and *fasciata*, sp. n., fig. 5, locality unknown.

APLYSIIDÆ.

Aplysia fasciata (Poir.), *depilans* (L.), and *Dolabrifera lafonti*, sp. n., indicated, but not described, all three observed alive at Arcachon, South-western France, and described by T. Fischer, Ann. Sc. Nat. (5) xiii. No. 2, pp. 1-8.

Aplysia melanopus, sp. n., Couch, P. Z. S. 1870, pp. 173-175, with woodcuts, Polperro, Cornwall.

Dolabrifera brazieri, sp. n., Sowerby, P. Z. S. 1870, p. 250, Botany Bay.

NUDIBRANCHIATA.

PHYLLIDIDÆ.

Phyllidia lovenii, Bergh, Christiania-fjord, 10-15 fathoms, fully described by Sars, Bidr. Christ. faun. pp. 74-76.

DORIDIDÆ.

Doris luteocincta, sp. n., Sars, Bidr. Christ. faun. p. 77, Vallö in the fjord of Christiania, 10-20 fathoms.

Doris bilamellata, L., *tenella*, sp. n., Agass. MS., *pallida*, Agass., *diademata*, Agass., *planulata*, Stimps., and *grisea*, sp. n., Stimps. MS., Gould, Invert. Mass. (ed. 2) pp. 228-232, pl. 20. figs. 284-296, and pl. 21. figs. 298-309, Massachusetts.

Polycera lessonii, Orb., Gould, *l. c.* p. 226, pl. 17. figs. 242-248, Boston.

Ancula sulphurea, Stimps., Gould, *l. c.* p. 233, pl. 22. figs. 310, 314, Boston.

TRITONIIDÆ.

Doto coronata (Gmelin), Gould, Invert. Mass. 2nd ed. p. 236, pl. 16. figs. 233-237, Boston.

Doto crassicornis, sp. n., Sars, Bidr. Christ. faun. p. 79, pl. 12. figs. 1-6, Dröbak, 50-60 fathoms.

Caliphylla mediterranea, Costa (see Zool. Rec. iv. p. 553), from Naples, now fully described and figured, Ann. Mus. Nap. iii. 1869.

Bornella, spec. nov., from the Philippines, figured by Semper, Reis. Arch. Phil. ii. pl. 1. figs. 3-5.

Dendronotus arboreescens (Müll.), Gould, Invert. Mass. 2nd edit. p. 234, pl. 22. figs. 311-313, Massachusetts.

ÆOLIDIDÆ.

Æolis papillosa (L.) and *salmonacea*, Couthouy, Gould, Invert. Mass. 2nd edit. pp. 238-240, pl. 18. figs. 257-263 and 264, 265, Massachusetts.

Cratena bylgia, *longibursa*, and ? *lugubris*, spp. nn., Bergh in Semper's Reisen, ii. pp. 4-9, pl. 1. fig. 2, pl. 3. figs. 16, 17, and pl. 4. figs. 1-28, Philippines. (On the genus *Cratena*, see Zool. Rec. iv. p. 555.)

Flabellina, Cuv., redescribed by R. Bergh. *Rhinophoria perfoliata*. Tentacula elongata. Papillæ dorsales pedamentis compressis impositæ, eradiantes. Pes angulis anterioribus tentaculatim productis. Mandibulæ margine minutim denticulato. Radula dentibus uniseriatis. To this genus belong three Mediterranean species, *affinis* (Gmel.), *peregrina* (Gmel.), and *flabellum* (Vérany), and a fourth from the Philippines, *Fl. semperi*, sp. n., the anatomy of which is also given by R. Bergh in Semper's Reisen, pp. 18-30, pl. 2 and pl. 3. figs. 1-15.

Æolis (*Flabellina*) *bostoniensis*, Couthouy, *rufibranchialis*, Johnst., *pilata*, sp. n., and *stellata*, Stimps., Gould, Invert. Mass. 2nd edit. pp. 241-245, pl. 19. figs. 270-282, Massachusetts.

Cæcinella, gen. nov. *Rhinophoria* vagina instructa. Papillæ dorsales uniseriatæ; postice ad radicem caudæ insuper appendices claviformes adsunt. Bursæ cnidophoræ nullæ. Radula dentibus uniseriatis. Mandibulæ adsunt. *C. luctuosa*, sp. n., Bergh, l. c. p. 12, pl. 1. fig. 1, and pl. 5. figs. 1-19, Philippines.

Æolis (*Cavolina*) *picta*, Alder and Hancock, *diversa*, Couthouy, Gould, Invert. Mass. 2nd edit. pp. 246, 247, pl. 19. figs. 282 and 267, 268, 276, 280, Massachusetts.

Æolis (*Tergipes*) *despecta*, Johnst., and *gymnota*, Couthouy, Gould, Invert. Mass. 2nd edit. pp. 248, 249, pl. 16. figs. 222-225 and 238-241, Boston.

Colliopæa? *fuscata*, sp. n., Gould, ibid. p. 250, pl. 16. figs. 218-221, Boston.

Embletonia fuscata and *remigata*, spp. nn., Gould, ibid. pp. 251, 252, pl. 16. figs. 220-232 and 214-217, Boston.

Phyllobranchus prasinus, sp. n., Bergh, l. c. pl. 1. figs. 6-8, Philippines.

Cyerce, gen. nov., indicated from drawings made by C. Semper in the Philippine Islands, representing two species, *elegans* and *nigra*, Semper, l. c. pl. 1. figs. 9 and 10.

HERMÆIDÆ.

Hermæa cruciata, sp. n., Alex. Agassiz, MS., Gould, Invert. Mass. 2nd edit. p. 253, pl. 17. fig. 256, Naushon Island, Massachusetts.

Hermæopsis, gen. nov., *variopincta* [-*icta*], sp. n., Costa, Ann. Mus. Nap. iii. 1869, with figures, Naples.

Hero formosa (Lovén), from Christianiafjord, described by Sars, Bidr. Christ. fauna, p. 81.

Alderia harvardiensis, Agassiz, Gould, Invert. Mass. p. 254, pl. 16. figs. 226-228, Cambridge, Massachusetts.

Beccaria, gen. nov., allied to *Hermæa* and *Colliopæa*.—*B. tricolor*, sp. n., S. Trinchese, Ann. Mus. di Stor. nat. Genova, Dec. 1870, pp. 47-54, pls. 4-7, Genova.

ELYSIIDÆ.

Elysia albomarginata and *viridissima*, sp. n., not yet described, from Genoa. S. Trinchese, Bull. mal. Ital. iii. p. 31.

Elysia chlorotica, sp. n., Agassiz, MS., Gould, Invert. Mass. 2nd edit. p. 256, pl. 17. figs. 251-255, Cambridge, Massachusetts.

Placobranchus catulus, sp. n., Agassiz, MS., Gould, *ibid.* p. 256, pl. 17. figs. 249, 250, Boston.

PULMONATA.

GEOPHILA.

C. SEMPER's work on the land-snails of the Philippines is a very valuable addition to the anatomical knowledge of the exotic Pulmonata; the part which has been published treats only of the Zonitidæ, and devotes five of the seven plates to anatomical figures, especially the genital apparatus, the jaw, and the dentition of the radula. The author gives special attention to the prominent lobes of the mantle, which are not covered by the shell when the animal is in activity, distinguishing two sorts, the cervical lobes, extended forwards and covering a part of the neck before the shell, and the shell-lobes, which are reflected backwards and applied to the outer surface of the shell. There are ordinarily two of each sort present, a right and a left one; but in some genera the one or other is wanting or is subdivided.

Photographic figures of the dentition of 11 species of land- and fresh-water mollusca are given by W. Binney and Th. Bland, *Ann. Lyc. N. York*, ix. 1870, pp. 284-294. Tryon objects that the photographs never give such sharp lines as are requisite. *Am. J. Conch.* vi. pp. 169-171.

Land-snails devoured by a Spider, Stentz, *Nachr. mal. Ges.* ii. p. 148.

VAGINULIDÆ.

Veronicella floridana, Binney. Dentition figured from a drawing made by Dr. Leidy. Binney and Bland, *Ann. Lyc. N. York*, ix. p. 285.

AGNATHA (TESTACELLIDÆ).

Testacella. Nine French species reviewed by P. Massot, among which *T. pascalei*, *bourguignati*, and *servaini*, spp. nn., *Ann. Mal.* pp. 144-157.

The genus *Helicophanta* [*Daudebardia*] in general, and *H. rufa* and *brevipes* (Fér.) especially, are described from observations on the living animals by S. Clessin in Bavaria, *Nachr. mal. Ges.* ii. pp. 67-71.—Two French species of *Daudebardia* reviewed by Penchinat, *Ann. Mal.* p. 160.

Daudebardia nubigena and *atlantica*, spp. nn., Bourguignat, *R. Z.* 1870, pp. 14, 15, Algeria; the first from Blidah in "le petit Atlas," near the glaciers, the second from the wood of Edough, near Bona.

Rhytida inæqualis, not from Australia, but from New Caledonia and Lord Howe's Island, New Hebrides. Crosse, Martens, Semper, and Verkrüzen, *Nachr. mal. Ges.* ii. pp. 5, 26, 41.—In *Rh. strangei* (Pfr.) a radula like those of the *Testacellidæ* has been found by C. Semper, *ibid.* p. 102.

Glandina rosea (Fér.). Dentition with central tooth figured by Binney and Bland, *Am. J. Conch.* vi. p. 202.

Ennea (*Gonospira*) *ringens*, sp. n., H. Adams, *P. Z. S.* 1870, p. 379, pl. 27. f. 15, Sierra Leone.

Gibbulina modiolus (Fér.), radula examined. C. Semper, Nachr. mal. Ges. ii. p. 103.

Gibbus (*Gibbulina*) *bourguignati* (Desh.), from Bourbon, rather too near to *G. bacillus* (Pfr.), from Mauritius; also *G. intersecta* (Desh.) very doubtfully distinct from it. Nevill, J. A. S. B. xxxix. p. 410.

Gibbus (*Gibbulina*) *versipolis* (Fér.) = *funiculus* (Val.), Bourbon, the living animal of a rich dark orange colour. Nevill, *ibid.* p. 411.

OXYGNATHA (ZONITIDÆ).

The classification of the first family of *Pulmonata* proposed by C. SEMPER is the following :—

Family *Zonitidæ*. A mucous pore at the hinder end of the foot. Jaw smooth, without ribs. Lateral teeth of the radula subulate or bicuspidate.

Subfamily 1. *Ceratophora*. A horn-like prominence above the mucous pore; under surface of the foot longitudinally divided into three parts.

Tennentia, *Parmarion*, *Euplecta*, n. g., *Macrochlamys*, *Dendrolimax* (Dohrn), *Helicarion*, *Eurypus*, n. g., *Rotula* (Albers), *Martensia*, n. g., *Microcystis*, *Macroceros*, n. g. [Here should be inserted the American genus *Stenopus* or *Guppya*.]

Subfamily 2. *Aceratophora*. No horn-like prominence above the mucous pore; under surface of the foot not divided.

Ariophanta, *Xesta*, *Rhysota* (Albers), *Zonites*.

The anatomy of some Italian species of *Limax* has been studied by F. SORDELLI, Atti Soc. Ital. xiii. pp. 1-12; his observations lead him to distinguish the subdivisions of this genus in the following manner :—

I. Internal shell inequilateral, dorsal keel incomplete. Sheath of the male organ simple,

a. without flagelliform appendix: *Eulimax*, Moq.-Tand.

aa. as long as the matrix or longer: *Limax doriæ*, *dacampii*, *punctulatus*.

bb. not half as long as the matrix: *L. maximus*, *psarus*, *variegatus*, *arborum*.

b. with a flagelliform appendix: *Agriolimax*, Mörch, *L. agrestis*, L., and *flans*, Hay.

II. Internal shell equilateral. Dorsal keel complete. Sheath of the male composed of two parts. *Milax*, Gray, *L. marginatus*, Drap., *gagates* and *sowerbyi*.

Heynemann's list of the slugs of Europe and adjacent countries enumerates 18 species of *Limax*, subgen. *Heynemannia*, Malm, two of the subgenus *Malacolimax*, Malm, seven of the subg. *Agriolimax*, Malm, one *Lehmannia*, Heynem., five *Amalia*, Moq.-Tand., and one *Lallemantia*, Baudon, the last only from the Canary Islands; further 28 species, the generic place of

which is not yet ascertained. Nachr. mal. Ges. ii. pp. 162, 163.—Mabille reviews 20 French species of *Limax*, and 5 of *Milax*, Ann. Mal. pp. 130–143.

Limax flavus, Linn., dentition figured from a drawing made by Dr. Leidy. Binney and Bland, Ann. Lyc. N. York, ix. p. 285.

Limax dacampi, Meneghazzi, various varieties of colour described and figured by E. Bettoni in Bull. Mal. iii. pp. 161–166, pls. 3 and 4.—*L. punctulatus* and *bettonii*, spp. nn., and *L. doriae*, Bourg., anatomically distinguished from *L. dacampi*. Sordelli, Atti Soc. Ital. xiii. 12 pp.

Milax pyrriculus, sp. n., = *Limax marginatus* of Moquin-Tandon, not Müller. Mabille, Ann. Mal. p. 105.

Parnacella, four French species reviewed by Penchinat, Ann. Mal. p. 158.

Tennentia philippinensis, sp. n., Semper, l. c. p. 7, pl. 1. figs. 15, 16, representing the living animal, Mindanao; genital apparatus, jaw, and radula of the same, pl. 3. fig. 1, and pl. 6. fig. 17, the latter differing by its simple median tooth from that of the typical species, *T. thwaitei*, Humbert. The genus *Mariaella* (Gray, 1855) is probably identical, and has in that case priority. Semper, l. c. p. 8.

Parmarion (Fischer), the generic characters examined, genital apparatus and dentition of *P. pupillaris*, Humb., described and figured. Semper, pl. 3. fig. 2, and pl. 5. figs. 11, 12.—The African species, *P. flavescens* (Keferstein), differs by its lateral teeth being unicuspid instead of bicuspid, and belongs to *Urocyclus*, Gray.—*P. extraneus*, Fér., from Calcutta, figured from a specimen in spirits, pl. 1. fig. 5.—The following species, known only from the shell, belong probably to this genus:—*Vitrina papillata*, Pfr., *planata*, Pfr., *aperta*, Beck, and *Mariaella arayataensis*, sp. n., pl. 2. fig. 7, Philippines. Semper, l. c. pp. 9–12.

Dendrolimax, Dohrn (see Zool. Rec. v. p. 473), genital apparatus described and figured. Semper, l. c. pp. 19, 20, pl. 4. fig. 12.

Vitrina servainiana, sp. n., St. Simon, Ann. Mal. p. 20, S. France.

Vitrina darnaudi, Pfr., is only a variety of *rupepelliiana*, Pfr., both with intermediate forms in Abyssinia. Blanford, Obs. Geol. & Zool. Abyss. p. 474.

Vitrina? *venusta* and *ataranensis*, spp. nn., Theobald, J. A. S. B. xxxix. pp. 400–401; the first from Chungale-Sakan, Arakan Mountains, the second from the river Ataran, Martaban.

Helicarion, Fér. C. Semper characterizes this genus anatomically by the want of an appendicular gland in the vagina and a peculiar sac containing calcareous concretions at the vas deferens; he introduces into it, from his anatomical researches, several species, the shell of which agrees much more with that of *Helix* than with that of *Vitrina*, and arranges them in two series.

a. Species which have peculiar horny papillæ in the lumen of the penis. To this series belong all Philippine species. They live on trees, and when disturbed the hinder part of their foot is lost by vehement wriggling. They are:—*H. ceratodes*, Pfr., *gutta*, Beck, *helicoïdes*, sp. n., Camiguin, *crenularis*, Beck, *resiliens*, Beck, *incertus*, sp. n., island Cebu, Philippines, *margarita*, Beck, *tigrinus*, sp. n., pl. 2. fig. 13, Mindanao, *politissimus*, Beck, *bicarınatus*, sp. n., pl. 1. f. 8, Camiguin, Luzon, and *bisligenis*, sp. n., pl. 2. f. 12, Bislig in Mindanao. Of all these species the genital apparatus and the dentition are described, and the one or the other figured on pl. 4 and pl. 6. Several other Philippine species,

known only from the shell, and described as *Vitrina* by others, belong very probably also to this division.

b. Species without horny papillæ within the penis:—*Helicarion freycineti* and *H. cuvieri*, Fér., from Australia, and *H. pfeifferi*, Philippi, from the Fiji Islands, with helicoid shells; genital apparatus pl. 3. figs. 6-8; dentition pl. 6. figs. 10, 11, and 14. Semper, *l. c.* pp. 20-31.

Helicarion sogdianus, sp. n., Martens, SB. nat. Fr. 1870, p. 56, Samarkand.

Microcystis, Beck, elevated to the rank of a distinct genus by C. Semper; sexual apparatus very simple, without appendicular organs; only one cæcum at the penis. Some species are viviparous. *M. myops*, Dohrn, *succinea*, Pfr., *upolensis* and *perpolita*, Mouss., which are anatomically identical, and *palaensis*, O. Semper, pl. 2. fig. 16, from the Palau (Pelew) Islands: the genital apparatus and dentition figured pl. 3. f. 11, pl. 4. fig. 9, and pl. 6. figs. 21, 22, and 34. The following are known only from the shell:—*glaberrima*, sp. n., pl. 2. fig. 10, Mariveles, Luzon, 1500-3000 feet above the sea, *lactea*, sp. n., pl. 2. fig. 9, Arayat, Luzon, *wilsoni*, O. Semper, pl. 2. fig. 11, *margaritacea*, O. Semper, pl. 2. fig. 15, and *straminea*, sp. n., p. 48; the three last from the Palau Islands. Semper, *l. c.* pp. 43-48.

Nanina nodulata and *excrescens*, spp. nn., Mousson, J. de Conch. xviii. pp. 114, 115, pl. 7. figs. 4, 5, Fiji Islands, referred by the author to the subgenus *Microcystis*.

Macroceros, gen. nov., proposed by C. Semper for *Helix spectabilis*, Pfr., from Samar, Philippine Islands. Genital apparatus simple, without appendicular organs; teeth of the radula entire and blunt. The living animal figured pl. 1. figs. 6, 7; sexual apparatus pl. 4. fig. 4; jaw and dentition pl. 6. fig. 23. Semper, *l. c.* p. 49.

Nanina. Prof. C. SEMPER breaks up this genus into several smaller ones, founded chiefly on the presence or absence of some appendicular organs in the sexual apparatus, and of a horn-like prominence above the mucus-pore. These generic divisions do not agree with the conchological subgenera of former authors; and so the author is forced to use the names *Xesta*, *Rhysota*, *Ariophanta*, and *Helicarion* in a somewhat different sense than has been done hitherto. The name *Nanina* is purposely omitted. He arranges them, together with the other known genera furnished with a mucus-pore forming his family Zonitidæ, in the following manner:—

Xesta, Albers, also elevated to the rank of a distinct genus by C. Semper. Shell-lobes of the mantle varying in extension and development; a cylindrical appendicular gland with a cartilaginous terminal papilla, a sac with calcareous concretions at the vas deferens, a cæcum at the penis. Outer lateral teeth of the radula bicuspidate. Shell of very different form, vitrinoid or helicoid.

a. Shell-lobes very large, left cervical lobe not divided; shell vitrinoid. *X. cumingi*, Beck, from Mindanao, lives on trees, like *Helicarion*; the living animal figured pl. 1. fig. 4; the sexual apparatus pl. 4. fig. 5, and pl. 5. figs. 5-10; dentition pl. 6. fig. 28. The female appendicular gland is very exactly described, and declared to be the analogue of the multifid gland of the

European species of *Helix*, pp. 57–60. Also *Helix conoidalis*, Adams and Rv., may possibly belong to this section.

b. Shell-lobes tongue-shaped, left cervical lobe divided into two. Shell helicoid. *X. mindanaensis*, sp. n., p. 61 (the living animal pl. 1. fig. 1, the shell pl. 2. fig. 1), Mindanao, lives on the ground; a variety, or perhaps distinct species, p. 62. *X. distincta* (Pfr.), Cochinchina and Mindanao [is also abundant in Siam], *citrina* (L.), Moluccas. The genital apparatus, jaw, and dentition described and figured pl. 3. figs. 13 & 14, pl. 6. figs. 27 & 30, and pl. 7. fig. 12. The following species, known from the shell only, probably belong also to this section: *nobilis*, Pfr., and *obliquata*, Reeve, both from Zamboanga, Mindanao, *borneensis*, Pfr., *schumacheriana*, Pfr., *donovani*, Pfr., and *souleyetiana*, Pfr., from Borneo.

c. Shell-lobes rudimentary or wanting, left cervical lobe not divided. *X. bistrialis*, Beck, *ligulata*, Fér., *tranquebarica*, Fabr., *belangeri*, Desh., and *maderaspataana*, Gray, all from S. India; the sexual apparatus, jaw, and dentition of them described and figured pl. 3. figs. 15, 16 & 26, pl. 5. fig. 4, pl. 6. figs. 25 & 29, pl. 7. figs. 9–11. Semper, *l. c.* pp. 45–66.—The living animal of *Nanina ligulata* (Fér.) is also described and figured by A. Craven, Ann. mal. Belg. vol. iv. 1869, p. 93, pl. 3. According to this figure the hinder end of the foot is broad and flat, as the Recorder has observed it in *N. (Rhysota) ovum*, Val., and different from the elevated truncated extremity of *N. citrina* (L.).

Ariophanta, Desmoulins. C. SEMPER characterizes this genus in the following manner:—Both shell-lobes of the mantle present in most species; a female appendicular gland, composed of single lobuli, and connected with a calcareous sagitta; no appendicular glands on the male sexual organ. This genus is represented by the following species:—*rumphii*, v. d. Busch, Java; *martini*, Pfr., Sumatra; *nemorensis*, Müll., Celebes; *rareguttata*, Mouss., Adenare; *striata*, Gray, Singapore; and *atrofusca*, Albers, Singapore [and Borneo]. Genital apparatus, sagitta, jaw, and dentition of some of the species described and figured pl. 3. figs. 17–20, pl. 5. figs. 14 and 24, pl. 6. fig. 31, pl. 7. figs. 5–8. No species known from the Philippines. Semper, *l. c.* pp. 50–54.

Nanina (Ariophanta) immerita, sp. n., Blanford, J. A. S. B. xxxix. p. 17, South Canara.

Rhysota, Albers; also elevated to the rank of a genus by C. Semper. Shell-lobes quite absent; left cervical lobe divided into two parts. Sexual apparatus simple, without appendicular glands. All known species belong to the Philippines, and can be arranged according to the sculpture of the shell.

a. Shell wrinkled. *R. ovum*, Val., Luzon; *maxima*, Pfr., E. and N. Mindanao; *porphyria*, Pfr., Burias Island; and *dutitja*, O. Semper, Luzon. The sexual apparatus, jaw, and dentition of these four species described and figured pl. 4. figs. 1, 6 & 8, pl. 5. fig. 22, pl. 7. figs. 15 & 16. A new species belonging to this section, but known only from the shell, is *R. antonii*, sp. n., Semper, *l. c.* p. 72, pl. 2. f. 2, Luzon.

b. Shell decussated. *R. bulla*, Pfr., Luzon; *semiglobosa*, Pfr., Southern Luzon, Bohol, Leyte, Samar, Mindanao, and Basilan; the shell varies much, 1870. [VOL. VII.]

and *Helix fulvida*, Pfr., is only a small variety of it. The sexual apparatus and the dentition of both species described and figured pl. 4. figs. 7 & 15, pl. 7. fig. 14; the animal of the second pl. 1. fig. 2.—*R. globosa*, sp. n., known only from the shell, pl. 2. fig. 3, Mindanao.—*R. semigranosa*, Sowerby, is identical with *panayensis*, Pfr., and Pfeiffer's *semigranosa* is another species, called *R. moussoni* by C. Semper.

c. Shell hairy. *R. gummata*, Sow., sexual apparatus as in the preceding, the six outermost lateral teeth of the radula tricuspidate (pl. 6. fig. 32); *R. setigera*, Pfr., sexual apparatus not known, lateral teeth unicuspidate (pl. 6. fig. 33): both from Luzon.—*R. striatula*, sp. n., known only from the shell, pl. 2. fig. 4, province Ylocos, Luzon.

Sixteen other Philippine species, known only from the shell, are enumerated, and for the most of them new and exact localities given. Semper, *l. c.* pp. 68–77.

Rhyssota chamberlinii, Tryon, 1869, = *Helix haughtoni*, Bens. 1863. Stoliczka, P. As. Soc. Beng. 1870, p. 87.

Helix (Hemiplecta) fordii, sp. n., Brazier, P. Z. S. 1870, p. 662, Tasmania.

Macrochlamys, Bens. This name is limited by C. Semper, as proposed by Adams and by the Recorder, to the species of *Nanina* the shell of which is smooth and shining both on its upper and under surface. Two long tongue-shaped shell-lobes; the left cervical lobe divided into two. Anatomical particulars as in *Euplecta*, described and figured from *M. splendens*, Hutton, Calcutta, pl. 5. fig. 10, and *honesta*, Gould, Andaman Islands, pl. 5. fig. 20. To this genus are referred:—*M. ? crebrostriatus*, sp. n., pl. 2. fig. 6, Basilan and Zamboanga; *M. ? henrici*, O. Semper, MS., sp. n., pl. 2. fig. 5, Northern part of Luzon: both known only from the shell. Semper, *l. c.* pp. 17–19.

Nanina (Macrochlamys) geoffreyi, H. Adams. The living animal described by G. Nevill. J. A. S. B. xxxix. p. 406.

Macrochlamys cutteri, sp. n., H. Adams, P. Z. S. 1870, p. 794, Sarawak.

Orobia andamanensis, Tryon, 1869, = *Helix exul*, Theobald, 1864, and perhaps also = *H. stephus*, Bens. Stoliczka, *l. c.* 1870, p. 87.

Euplecta, gen. nov. Cervical lobes of the mantle developed, the left subdivided into two; shell-lobes rudimentary. Shell external, striated or ribbed above. A cylindrical appendicular gland in the female sexual apparatus, with a rudimentary analogue of the sagitta. This genus is founded on *Helix subopaca*, Pfr., and *H. layardi*, Pfr., the anatomical particulars of which are described and figured, pl. 3. figs. 3 & 4, pl. 6. figs. 19 & 20. The following species, known only from the shells, are placed here with doubt:—*Helix boholensis*, Pfr., *filocincta*, Pfr., *orthostoma*, Pfr., *biangulata*, Pfr., *armida*, Pfr.; *E. rotundata* and *bicarinata*, spp. nn.; the last only figured, pl. 2. fig. 8. Semper, *l. c.* pp. 14–16.

*Eurypus**, n. g., type *Helix casca*, Gould, Fiji Islands. Foot with the back broad, not carinated; genital apparatus as in *Helicarion*; *E. similis*, sp. n. pl. 2. fig. 14, Fiji Islands. The animals observed from specimens in spirits; the genital apparatus, jaw, and radula of both described and figured, pl. 1. figs. 12 & 18, pl. 3. fig. 10, pl. 6. figs. 10 & 12. Semper, *l. c.* pp. 36, 37.

Nanina fragillima, sp. n., Fiji Islands. Allied to *casca*. Mousson, J. de Conch. xviii. p. 112, pl. 7. fig. 3.

Martensia, gen. nov., type *Helix mossambicensis*, Pfr. The shell-lobe of

* Preoccupied in Coleoptera.

the right side is wanting, the left cervical lobe divided into two; two cæca and an acinous gland in the penis; the rest of the genital apparatus as in *Rotula*, pl. 3. fig. 5; dentition pl. 6. fig. 15. Semper, *l. c.* p. 42. [= *Trochonanina*, Mousson (Zool. Rec. vi. p. 563), which has priority.]

Nanina phicatulæ, cherrænsis, rubelloincta, austeni, falcata, and *koondaensis*, spp. nn., Blanford, J. A. S. B. xxxix. pp. 13–16, pl. 3. figs. 7–12, British India.—*Helix ochthoplax*, Bens., from the Khasi hills and Northern Cachar, probably not from Pegu, Blanford, *ibid.* p. 28.

*Rotula**, Albers, elevated to a separate genus by C. Semper. Horn-like prominence above the mucus-pore short or wanting; shell-lobes mostly absent. No appendicular gland in the female; a sac with calcareous concretions on the vas deferens, and a cæcum on the retractor penis. To this genus belong:—*calatura*, Fér., *rufa*, Less., *massoni*, Behn, and *campbelli*, Gray, all described hitherto as *Helix*. The sexual apparatus, jaw, and dentition of these four species described and figured, pl. 3. figs. 22, 23, 25, & 28, pl. 7. figs. 1, 2, 3 & 17. Probably also *Helix rawsoni*, Bens., *detecta*, Fér., *cernica*, H. Adams, and *imperfecta*, Desh., belong to this genus, but they are known only from the shell. *H. philyrina*, Morelet, must be reexamined; its radula figured pl. 6. fig. 35. All the above species are from Mauritius or Bourbon except *R. massoni*, which lives on the Nicobar Islands. Semper, *l. c.* pp. 38–41.

Nanina implicata, sp. n., Bourbon, forming with *argentea* (Reeve), *linophora*, Morelet, and *semicerina*, Morelet, which last = *rawsoni*, Bens., a small group of closely allied Mascarene species. Nevill, J. A. S. B. xxxix. pp. 406, 407.

Nanina pratumida, Fér., the living animal described; and *N. cordemoyi*, sp. n., closely allied to the former, but from Bourbon. Nevill, *l. c.* p. 408.

Helix cælatura, Fér., is probably a true *Helix*, not a *Nanina*. Nevill, *l. c.* p. 413.

Nanina (Trochomorpha) apicata, sp. n., Blanford, *l. c.* p. 16, pl. 3. fig. 13, Nilgherries, in their highest parts.

[*Trochomorpha*] *Helix (Videna) kingi*, sp. n., Brazier, P. Z. S. 1870, p. 662, Tasmania.

Trochomorpha accurata, sp. n., Mousson, J. de Conch. xviii. p. 120, pl. 7. fig. 2; *T. transarata*, Mouss., figured, *ibid.* pl. 7. fig. 1. Some new varieties of this and allied species described by the same, *ibid.* pp. 121, 123. *Helix abrochroa*, Crosse, 1868, belongs also to this group; it is figured by Crosse, *ibid.* pl. 1. fig. 2. All from the Fiji Islands.

Nanina (Sesara?) ataranensis, sp. n., Theobald, J. A. S. B. xxxix. p. 401, pl. 18. fig. 7, Ataran river, Martaban.

Zonites, Montf. The anatomical characters given from examination of *Z. verticillus*, Fér.; the sexual apparatus figured pl. 5. fig. 1, and stated to be very near to those of *Rhysota*. Several American species also agree in their anatomical character with *Zonites*, and may enter into the same genus; for example, *Helix lucubrata* (Say), genital apparatus figured pl. 3. fig. 27, jaw and radula pl. 5. fig. 21; probably also *H. euryomphala*, Morelet, *fuliginosa*, Griffith, *inornata*, Say, *caduca*, Pfr., and *bilineata*, Pfr. But in America there are also Zonitidæ with horn-like prominence above the mucus-pore,

* This name is preoccupied for a genus of *Echinida*.—THE RECORDER.

for example, *Helix selenkai*, Pfr., from Mexico. The radula of this, or a nearly allied species, with bicuspidate lateral teeth, figured pl. 3. fig. 25. Semper, *l. c.* pp. 78-80. [These latter American species ought to be compared with *Stenopus*, Guilding, = *Guppya*, Tate. See Zool. Rec. vi. p. 563.]

Zonites catoleius, sp. n., Bourguignat, R. Z. 1870, p. 87, pl. 15. figs. 1-3, Assuan.

Zonites levigatus, Pfr., photograph of the dentition, Binney and Bland, Ann. Lyc. N. Hist. ix. 1870, p. 286.

[*Hyalina*] *Zonites cellarius* (Müll.), var. *elevatus*, n., Van der Broeck, Ann. mal. Belg. iv. (1869) pp. 88, 89, pl. 2. fig. 4 (jaw and sexual organs), Brussels.

Hyalina draparnaldi, Beck, has been described and figured as Bavarian by Alten, 1812, under the name *Helix nitens*, and is not rare at Augsburg. Clessin, Nachr. mal. Ges. ii. p. 105, 106.

[*Hyalina*] *Helix glabra*, Stud., found in Cheshire by Th. Rogers; also at Grassmere and Barmouth, and in Normandy. Jeffreys, Ann. N. H. (4) v. p. 385.

Hyalina excavata, Bean, hitherto exclusively British, is stated to have been found also near Glückstad in Sleswick. E. Friedel, Mal. Bl. xvii. p. 62.

[*Hyalina*] *Zonites septentrionalis*, sp. n., Alps of France and Switzerland, and northern parts of France, very near *draparnaldi* (Beck); *farinesianus*, sp. n., Collioure and Port Vendres in South-western France; *navaricus*, sp. n., both sides of the Pyrenean mountains. Bourguignat, R. Z. 1870, pp. 17-20. *Z. durandoianus*, sp. n., Roknia and Bougie in Algeria; *Z. pictonicus*, sp. n., Charente, Vendée, and Deux-Sèvres; *Z. courquini* and *jaccetanicus*, spp. nn., Barcelona. Bourguignat, *l. c.* pp. 87-91.

Helix (Hyalina) nelsoniensis, sp. n., Brazier, P. Z. S. 1870, p. 661, Mount Nelson, Tasmania.

Zonites (Hyalina) plicostriatus, sp. n., Mousson, J. de Conch. xviii. p. 116, Viti-Levu.

[*Hyalina*] *Zonites tuxtlentis*, sp. n., Crosse and Fischer, J. de Conch. xviii. p. 237, Tuxtla, province of Vera Cruz, Mexico. Allied to *bilineata* (Pfr.).

Helix tumida, Pfr., photograph of the dentition, Binney and Bland, Ann. Lyc. N. York, ix. 1870, p. 283.

ODONTOGNATHA and AULACOGNATHA.

Philomycus. R. Bergh defends this name, and gives full external and anatomical descriptions of the North-American species *Ph. carolinensis*, Bosc, and the Hawaiian *Ph. australis*, sp. n.; besides other differences, the jaw is smooth in the first and ribbed in the second species [as also in the Japanese *Ph. bilineatus*, Bens.]. Also *Ph. dorsalis*, Binn., is regarded by him as distinct from both. Verh. z.-b. Wien, xx. pp. 854-867, pl. 13. figs. 11-14 (anatomical particulars of *Ph. australis*).

Heynemann's list of the slugs of Europe and the adjacent countries enumerates 7 species of *Geomalacus*, Allm., 4 of *Arion*, subgenus *Lochea*, Moq.-Tand., 3 of the subgenus *Prolepis*, Moq.-Tand., and 2 of the subgenus *Baudonia*, Mab., also 2 species the subgeneric place of which is not yet ascertained. Nachr. mal. Ges. ii. pp. 163, 164.—J. Mabille reviews the species occurring in France, which are 22 of *Arion* and 6 of *Geomalacus*. Ann. Mal. p. 105.

Arion rufus (L.), var. *fasciatus*, Van der Broeck, Ann. mal. Belg. iv. (1869) p. 87, pl. 2. fig. 3, Bel Oeil, province Hainault (Hennegau), in Belgium.

[*Patula*] *Helix simoniana*, sp. n., Bourguignat, R. Z. 1870, p. 22, Toulouse; belongs to the group of *H. pygmaea*, Drap., ten species of which are enumerated, *ibid.* pp. 24, 25.

[*Patula*] *Helix* (*Charopa*) *curaçœ*, *risii*, *rotella*, *onclowi*, *neglecta*, *ammonioidea*, and ? *dispar*, spp. nn., Brazier, P. Z. S. 1870, pp. 659-661, Tasmania.

Helix (*Patula*) *stellata*, new name for *similis*, Cox, preoccupied, Brazier, P. Z. S. 1870, p. 662.

Patula inermis and *adposita*, spp. nn., Mousson, J. de Conch. xviii. pp. 118, 119, pl. 7. figs. 7 & 8, Fiji Islands.

Patula (*Endodonta*) *subdædalea*, sp. n., Mousson, *l. c.* p. 117, pl. 7. fig. 6, Mango, Fiji Islands.

Helix. European species :—

[*Fruticicola*] *Helix martorelli*, sp. n., Bourguignat, R. Z. 1870, p. 26, pl. 15. figs. 12-16, Barcelona.

Helix tenietensis, sp. n., Bourguignat, *l. c.* p. 27, pl. 15. f. 7-11.

Helix saussuri, sp. n., Colbeau, Ann. mal. Belg. iii. (1868) p. 98, pl. 2. f. 1, Belgium.

Helix cantiana, var. *pyramidata*, n., Colbeau, *l. c.* p. 98, pl. 2. f. 3, Belgium.

Helix sericea, var. *fontanei*, n., Colbeau, *l. c.* p. 99, f. 4, Belgium.

[*Xerophila*] *Helix henoniana*, sp. n., Bourguignat, *l. c.* p. 166, pl. 15. f. 4-6, Kabylia. Near *H. amanda*, Rossm.

[*Xerophila*] *Helix lamalonensis*, sp. n., Reynes, Ann. Mal. p. 35, Hérault. Very small, near *H. cemenalea* (Risso).

[*Xerophila*] *Helix unifasciata*, var. *albicinctella* and var. *namuriensis*, n., Colbeau, *l. c.* p. 99, pl. 2. figs. 5 & 6. Another Belgian variety of the same = *conspurcata* of Kickx, not Drap., mentioned by v. d. Broeck in the same journal, iv. (1869) p. 81.

Helix unifasciata, Poir., = *candidula*, Stud., several varieties in the province of Verona. Betta, Moll. prov. Veron. p. 48.—*H. candicans*, Ziegl., *ammonis*, A. Schmidt, and *obvia*, Hartm., are distinct, but intermediate specimens occur within the province of Verona, though in different parts of it. Betta, *l. c.* pp. 46-49.

[*Campylea*] *Helix schlerotricha* [*sclero-*], sp. n., Bourguignat, R. Z. 1870, p. 21, pl. 14. figs. 1-4, Kabylia.

Helix fætens (Stud.). V. Martens considers that it is quite distinct from the *fætens* of Rossmässler and Pfeiffer, which is to be called *ichthyomma*, Held., and probably identical with the *zonata* of the German authors. Nachr. mal. Ges. ii. pp. 197-200.

Helix kleciachi, Dalmatia, *prætexta*, Dalmatia, *verticillata*, Rhodes, *turritella*, Dalmatia, *gyroidea*, Croatia, and *aranaea*, Sicily, spp. nn., named by Parreyss, but described by Pfeiffer, Mal. Bl. xvii. pp. 141-145.

Helix strigata, Müll., its varieties, including *H. umbrica*, Charp., are noticed by Issel, Bull. mal. Ital. iii. p. 114.

Helix laurenti, sp. n., Bourguignat, R. Z. 1870, p. 95, pl. 14. figs. 5-7, Almeria in Spain; allied to *gualtieriana*, L.—*H. planata*, Chemn., figured for comparison, *ibid.* figs. 8-10.

Helix nemoralis. Baudelot has observed that the young of specimens without bands or with many bands are similar to the parent; but the single-banded specimens produced young with or without bands indifferently. Bull. Soc. Strasb. i. (1868) pp. 132-134.

Helix hortensis, var. *minima*, Colbeau, Ann. mal. Belg. iii. (1868) p. 98, pl. 2. fig. 2, Belgium.

Helix pollinii, Da Campo. The view that this is only an albino variety of *grisea* is successfully defended against Bourguignat by E. de Betta, Moll. prov. Veron. pp. 59-61.

Helix. African species :—

Helix (*Corilla*) *damarensis*, sp. n., H. Adams, P. Z. S. 1870, p. 379, pl. 27. fig. 14, Damara land. Closely allied to *sculpturata* (Gray).

Helix borbonica, Desh., is only a variety of *similaris*, Fér. Nevill, J. A. S. B. xxxix. p. 414.

Helix salaziensis, sp. n., Nevill, l. c. p. 415, Bourbon, in the centre of the island. Very minute.

Helix. Asiatic species :—

Helix (*Plectopylis*) *macromphalus*, sp. n., Blanford, J. A. S. B. xxxix. p. 17, pl. 3. fig. 14, Khasi hills.

Ampelita bigsbyi, Tryon, 1869 = *Helix trochalia*, Bens. 1861. Stoliczka, P. As. Soc. Beng. 1870, p. 87.

Helix (*Camena*) *hainanensis*, sp. n., H. Adams, P. Z. S. 1870, p. 8, pl. 1. fig. 15, and Pfr. Novitat. Conch. iv. pl. 111. figs. 5-7, Hainan.

Helix (*Camena*) *maackii*, var. *unizonalis*, new var., H. Adams, l. c. p. 793, Ichang gorge, China.

Helix (*Satsuma*) *albida*, sp. n., H. Adams, l. c. p. 376, pl. 27. f. 9, Taiwan, Formosa.

Helix (*Plectotropis*) *christinae* and *mariellae*, (*Acusta*) *brevispira* and *nora*, (*Camena*) *constantiae*, spp. nn., H. Adams, l. c. pp. 377, 378, pl. 27. figs. 4-8, Ichang, China.

[*Plectotropis* ?] *Helix ancylochila* (Crosse) figured J. de Conch. xviii. pl. 1. fig. 1.

Helix leucophthalma, sp. n., Pfr. Mal. Bl. xvii. p. 93, and Novit. Conch. iv. pl. 111. figs. 8, 9, Celebes? Allied to *H. conformis* (Fér.).

[*Cochlostyla*] *Helix damahoyi*, Pfr. Novitat. Conch. iv. p. 8, pl. 111. figs. 1-4, Philippines.

Felix. Australian and Polynesian species :—

Helix rainbirdi and *thatcheri*, spp. nn., Queensland, and *convicta*, sp. n., Port Nicholson, Western Australia. Cox, P. Z. S. 1870, pp. 170, 171, pl. 16. figs. 1, 2. [The first two belong to the group *Hadra*, the third perhaps to *Rhagada*.]

Helix (*Galaxias*) *meadii*, new name for *edwardsi*, Cox, which is pre-occupied. Brazier, P. Z. S. 1870, p. 662. [Already named *nigrilabris* by the Recorder in 1869. See Zool. Rec. vi. pp. 567, 568.]

Helix gentilsiana and *goulardiana*, spp. nn., Crosse, J. de Conch. xviii. p. 136, New Caledonia.—*H. ouveana*, Soubervie, described anew and figured, ibid. p. 82, pl. 9. fig. 1, New Caledonia.—*H. abax*, sp. n., Marie, ibid. p. 139, New Caledonia: allied to *H. vieillardi*.—*H. subcoacta* and *mehitæ*, spp. nn.,

Gassies, *l. c.* pp. 140, 141, Art Island.—*H. vincentina*, *subsidualis*, *ferrieziana*, *ostiolum*, *noumeensis*, and *minutula*, spp. nn., Crosse, *l. c.* pp. 238–241, New Caledonia.—*H. metula* and *biocheana*, spp. nn., Crosse, *l. c.* pp. 248, 249, Bougainville's Island, Solomon archipelago.

Helix nova-georgiensis! and *chancei*, spp. nn., Solomon Islands, and *H. macgregori*, sp. n., New Ireland, Cox, *l. c.* pp. 170, 171, pl. 16. figs. 3, 5, & 4. [The first resembles somewhat *H. exceptiuncula* (Fér.); the second approaches the group *Ophiogyra*; the third belongs to *Papuina*.]

Helix allecta, Upolu; *wanganensis*, Solomon Islands; *quintalæ*, *exagitans*, *patescens*, and *depsta*, Norfolk Island; *helva*, *ardua*, *antelata*, *retardata*, and *vannæ-leve*, New Hebrides; *soreria*, Fiji Islands; *sansitus*, Banks's group and Fiji; *tutuillæ*, Navigators' Islands, spp. nn., Cox, *l. c.* pp. 81–84. [Several of them may possibly belong to *Trochomorpha*, *Nanina*, or *Patula*. Perhaps a mistake has been made concerning *H. vannæ-leve*, the locality of which is stated as above, whilst the island Vanna-leve, Banks's group, is given for another species.]

Helix cyrene and *cymodoce*, Crosse, figured J. de Conch. xviii. pl. 1. fig. 2, and pl. 2. figs. 2 & 3, Pacific Islands.

Helix. American species :—

Helix muscarum, Lea, jaw smooth, Binney and Bland, Am. J. Conch. vi. p. 204, pl. 9. fig. 16; its dentition, *ibid.* fig. 4; dentition of *H. microdonta*, Desh. *ibid.* p. 206.

Helix orbiculata, Fér., jaw smooth, Binney and Bland, *l. c.* p. 205, pl. 9. fig. 14; *aspera*, Fér., and *acuta*, Lam., dentition described, *l. c.* p. 204.

Helix hillei, sp. n., Gundlach, MS., Pfr. Mal. Bl. xvii. p. 90, Cuba.

Helix quadrivittata, *martinezi*, *amancaezensis*, and *baezensis*, Hidalgo, figured J. de Conch. xviii. pl. 6. figs. 1–4; *H. besckei*, Dunker, probably a young shell, and some notes concerning *H. atrata*, Pfr., *pazi*, Phil., and *raymondi*, Phil. Hidalgo, *l. c.* pp. 31–37.

Helix fidelis, Gray, jaw smooth, Binney and Bland, *l. c.* p. 207, pl. 9. fig. 1, dentition *l. c.* fig. 9, of *H. tudiculata*, Binn., fig. 7; *Helix redimita*, Binn., jaw ribbed, *ibid.* p. 206, pl. 9. fig. 11; *H. hemphilli*, Newc., jaw smooth, *ibid.* p. 207, pl. 9. fig. 3.

Mesodon leucodon and *labiatum*, Rafinesque, their descriptions and figures copied from a manuscript, published by Binney and Bland, Ann. Lyc. N. York, ix. p. 294; the latter seems to be a carinated variety of *Helix palliata*.

Placostylus elobatus (Gould) is to be kept distinct from *founaki* (Hombron et Jacquinot); the first belongs to the Fiji Islands, the other to the New Hebrides. Mousson, J. de Conch. xviii. p. 124. The first may be identical with *colubrinus* (Pfr.), erroneously indicated from New Caledonia. Crosse, *ibid.* p. 125, footnote.

Bulimus kantavuensis, sp. n., Crosse, *l. c.* p. 250, Kantavu, Fiji Islands (cf. Mousson, *ibid.* p. 229); it is allied to *B. seemanni* (Dohrn).

Bulimus pancheri, sp. n., Crosse, *l. c.* p. 137, New Caledonia, allied to *B. fulguratus* (Jay); *B. buccalis*, *ouensis*, *pinicola*, and *theobaldianus*, spp. nn., Gassies, *l. c.* pp. 141–143, New Caledonia. Some remarks upon and new varieties of known species of *Bulimus* from New Caledonia, by Crosse, *ibid.* pp. 242–244.

Bulimus goroensis, sp. n., Souverbie, J. de Conch. xviii. p. 76, New Caledonia, 105 millim. long.—*B. submariei*, *annibal*, and *boulariensis*, Souverbie, described anew, and figured by Souverbie, *ibid.* pp. 76–82, the first two figured pl. 9. figs. 2 and 3; all from New Caledonia.

Bulimus san-christovalensis, sp. n., Cox, P. Z. S. 1870, p. 172, Solomon Islands.

Bulimus cantagallanus, Rang. = *proximus*, Sow.; but the shell described as *B. cantagallanus* by Deshayes = a variety of *B. ovatus*, and that by Pfeiffer a third species, to be named *B. gummatius*, Hidalgo, J. de Conch. xviii. pp. 41–43.—*B. semipictus*, Hidalgo, figured *ibid.* pl. 6. fig. 7.—*B. corydon* and *B. aristæus*, Crosse, figured *ibid.* pl. 6. figs. 5 and 6, both from Quito.

Bulimus magnificus, Grateloup, *odontostomus*, Sow., and *hanleyi*, Pfr., dentition and jaw described by Binney and Bland, Am. J. Conch. vi. pp. 208, 209.

Achatina (Limicolaria) flammea var. *festiva*, and *sennaarensis* var. *gracilis*, new varieties from the upper system of the White Nile. Martens, Mal. Bl. xvii. pp. 33, 34; figured in Pfeiffer's Nov. Conch. iv. pl. 110. figs. 6, and 4, 5.

Achatina dohrniana, sp. n., Angola, and *A. dammarensis*, sp. n., Damara Land. Pfr. Mal. Bl. xvii. pp. 29–31, and Nov. Conch. iv. pp. 1, 2, pl. 109. figs. 1, 2, and 3, 4; the first large, the other small. Allied to *A. bayoniana*, Morelet.

Achatina nilotica (Pfr.) belongs rather to *Achatina* than to *Bulimus*; a slight notch at the base of the pillar-lip is found even in young specimens. Martens, Mal. Bl. xvii. p. 32; the same figured by Pfeiffer as *Limicolaria nilotica*, Nov. Conch. iv. p. 5, pl. 110. figs. 1–3.

[*Buliminus*] *Lulimus vicarius*, sp. n., Blanford, J. A. S. B. xxxix. p. 18, pl. 3. fig. 15, Garo Hills, Assam.—*B. calcadensis*, sp. n., Beddome, MS., described by Blanford, l. c. p. 18, Calcad Hills, Travancore.

[*Buliminus*] *Bulimus dammarensis*, sp. n., Pfr. Mal. Bl. xvii. p. 93, and Nov. Conch. iv. p. 3, pl. 109. figs. 5–8, Damara Land.—*Bulimulus damarensis* and *pygmæus*, spp. nn., H. Adams, P. Z. S. 1870, p. 9, pl. 1. figs. 17 and 18, Damara Land.

[*Buliminus*] *Bulimus detritus* (Müll.) observed by Göthe, 1814, on the heath of Mombach. Kobelt, Nach. mal. Ges. ii. p. 54.

Buliminus fasciolatus var. *piochardi*, n., Heynemann, Nachr. mal. Ges. ii. p. 126, Cyprus.

Achatinella. Twenty-six species, living on the island of Kauai, are enumerated and distributed between the subgenera *Leptachatina* and *Amastre* by Pease, J. de Conch. xviii. pp. 87, 88. *Leptachatina turgidula*, *costulosa*, *lævis*, *balleata*, *tenebrosa*, *extensa*, *lucida*, and *antiqua*, *Amastre spherica* and *rugulosa*, spp. nn., l. c. pp. 89–95, all from Kauai, Sandwich Islands; *Achatinella brevis*, Pfr. = *nucleola*, Gould, and Pfeiffer's *nucleola* = *Amastre rugulosa*. Pease, *ibid.* p. 96.

Tornatellina columellaris, sp. n., Mousson, J. de Conch. xviii. p. 129, Kananthia, Fiji Islands.—*T. conica*, Mouss., var. *impressa*, *id. ibid.* p. 128.—*T. noumeensis*, sp. n., Crosse, l. c. p. 244, New Caledonia.

Glossula, Martens, regarded as a distinct genus by Blanford: *Gl. filosa*, *singhurensis*, *rugata*, *lyrata* with var. *matheranica*, *pulla*, and *tornensis*, spp. nn., Blanford, J. A. S. B. xxxix. pp. 19–22, pls. 3. figs. 16–22, S. India.

Azeca tridens var. *alzenensis*, n., St. Simon, Ann. Mal. p. 20, S. France.

Cæcilianella acicula (Müll.). Vertical striæ of the jaw truncate in the

middle; dentition described; auditory ganglions connate. Sordelli, Att. Soc. Ital. xiii. fasc. 1.—A note concerning its occurrence by S. Clessin, Nachr. mal. Ges. p. 25.

Rumina (Subulina) teres, sp. n., H. Adams, P. Z. S. 1870, p. 8, pl. 1. fig. 14, Hainan island.

Stenogyra clavulina (Potiez et Mich.), two forms of it living on Bourbon described by Nevill, J. A. S. B. xxxix. p. 409.

Stenogyra novemgyrata, sp. n., Mousson, J. de Conch. xviii. p. 126, Oneata, Fiji Islands.

Stenogyra (Opeas) terebralis, sp. n., Theobald, J. A. S. B. xxxix. p. 401, Shan States.

Opeas pealei, Tryon, 1869, = *Spiraxis haughtoni*, Bens. 1863. Stoliczka, P. A. S. B. 1870, p. 87.

[*Clausilia itala*] *Cl. alboguttulata*, Wagner, = *albopustulata* (Jan), and *Cl. braunii*, Charp., are distinguished *pro tempore* as species! Betta, Moll. prov. Veron. pp. 74–76.

Pollinia, new subgenus of *Clausilia*, type *Cl. baldensis*, Parr. Betta, l. c. p. 76.

Clausilia (Phædusa) bensoni, sp. n., Pfr. P. Z. S. 1870, p. 378, pl. 27. fig. 10, Ichang gorge, China.

Clausilia crossei, Hidalgo, figured J. de Conch. xviii. pl. 6. fig. 9, Ecuador, *Pupa cænopicta*, Hutt., = *sennariensis*, Pfr., = *senegalensis*, Morelet, India, Abyssinia, and Senegal. Blanford, Obs. Abyss. p. 476.

Pupa fartoides and *salviniana*, spp. nn., Theobald, l. c. p. 400, Shan States.

Pupa oblonga, Pfr., found at Bahia and Montevideo by Paz; perhaps identical with *P. curta*, Anton, and *P. mihola* (Orb.), Hidalgo, l. c. pp. 65, 66.

Vertigo cylindrica, sp. n., Colbeau, Ann. mal. Belg. iii. (1868) p. 97, pl. 2. fig. 7, Belgium.

Vertigo (Pagodella) incerta, sp. n., Nevill, J. A. S. B. xxxix. p. 413, very near to *ventricosa*, H. Adams, from Mauritius.

[*Strophira*] *Pupa tenuilabris*, sp. n., Gundlach, Pfr. Mal. Bl. xvii. p. 91, Cuba.—*P. gubernatoria*, Crosse, figured J. de Conch. xviii. pl. 2. fig. 4, Bahama Islands.

Eucalodium, Crosse et Fischer. Jaw arched, finely striated, with a short laminar appendix recalling that in *Succinea*; teeth of the radula in transverse rows, tricuspidate, similar to those of *Helix*.—*E. ghiesbreghtii*, Pfr., Crosse and Fischer, J. de Conch. xviii. pp. 13 and 21, pl. 5. figs. 1–4, Mexico and Guatemala.

Berendtia, Crosse et Fischer. Jaw arched, with very strong longitudinal ribs; teeth of the radula similar to those of the preceding genus.—*B. taylori*, Pfr., Crosse and Fischer, l. c. pp. 15 and 23, pl. 5. figs. 11–13.

Holospira, Martens (p.). Erected by Crosse and Fischer into a distinct genus, the teeth of the radula being in transverse rows and tricuspidate, similar to those of the two preceding genera, the jaw very thin and smooth.—*H. pfeifferi*, Menke, and *tryoni*, Pfr., peculiar to Texas and the adjoining part of Mexico. Crosse and Fischer, l. c. pp. 13, 14, and 23, 24, pl. 5. figs. 5–10.

GONIOGNATHA.

Orthalicus zebra (Müll.) and *undatus* (Brug.). Dentition figured by Binney and Bland, Am. J. Conch. vi. p. 213, pl. 9. figs. 2, 10, and 12.

Orthalicus pfeifferi, Hidalgo, figured by J. de Conch. xviii. pl. 6. f. 8.

[*Chersina*] *Achatina virginea* (L.). Dentition figured by Binney and Bland, l. c. p. 210, 211, woodcut; that of *A. fasciata* (Müll.), ibid. pl. 9. f. 6.

[*Bulimulus*] *Bulimus pallidior*, Sow. Photograph of the dentition, Binney and Bland, Ann. Lyc. N. Hist. ix. 1870, p. 282.—*B. marielinus*, Poey, jaw described by the same, Am. Journ. Conch. vi. p. 209.

Bulimulus sufflatus (Gould), the compound jaw figured by Binney and Bland, l. c. pl. 9. f. 8; the dentition, ibid. f. 13.

[*Bulimulus*] *Bulimus chanchamayensis*, Hid., kept distinct from *canaliculatus*, Pfr., by the author, with some notes on *B. atacamensis*, Pfr., *broderipi*, Sow., *atahualpa*, Dohrn, and several species of Reeve and Pfeiffer reduced with more or less probability to varieties by Hidalgo, l. c. pp. 49–63; *B. baezensis*, Hidalgo, figured pl. 1. fig. 3, Ecuador.

Cylindrella, Pfr. H. Crosse and P. Fischer (J. de Conch. xviii. pp. 1–27) divide this genus, from the dentition, into two different types. The true *Cylindrella* are chiefly represented in the islands of the West Indies, and may be formed, together with the genus *Macroceramus*, into a distinct family, to be called *Cylindrellidae*, and to be placed near the *Goniognatha* of Dr. Mörch. The genus *Cylindrella* may be distributed, with regard to the radula, in the following manner:—

Group 1. *Cylindrella* proper: only two lateral teeth on each side, then following "marginal" teeth of very different form and in various number. *C. trinitaria*, Pfr., *gracilis*, Wood, *bahamensis*, Pfr., *costata* (Guilding), *agnesiana*, Adams, and *brookiana*, Gundlach, pl. 3. figs. 7, 8, pl. 4. figs. 1–3. This division will contain the groups called *Casta*, *Trachelia*, and *Mychostoma* by Albers.

Group 2. *Callonia* (n. g.): more than two lateral teeth, marginal teeth not very different; median tooth very narrow.—*C. elioti*, Poey, pl. 3. figs. 9–13.

Group 3. *Thaumasia*, Albers (p.): more than two lateral teeth; marginal teeth not differing from them. *C. perlata*, Gundl., *vignalensis*, Wright, *brevis*, Pfr., *scava*, Gundl., *rosea*, Pfr., *sanguinea*, Pfr. pl. 4. figs. 4–6.

Lia, Albers: lateral teeth very numerous, with only one inner cuspid; no different marginal teeth. *L. maugeri*, Wood, pl. 3. figs. 1–5.

Macroceramus, Guilding: similar to the preceding, but with two distinct inner cuspids. *M. signatus*, Guilding, pl. 3. figs. 14–16.

For the other type which agrees with the dentition of *Helix*, see *Eucalodium* and *Holospira* among the *Aulacognatha*.

Cylindrella clercki, sp. n., Arango, MS., and *C. geminata*, sp. n., Pfr. Mal. Bl. xvii. pp. 91, 92, both from Cuba.

ELASMOGNATHA.

Athoracophorus modestus, sp. n., Crosse and Fischer, l. c. p. 238, New Caledonia.

Triboniophorus schüttei, Keferstein, 1865, anatomically described by R. Bergh, Verh. z.-b. Wiss. xx. pp. 843–854, pls. 11, 12, and 13. figs. 1–10; pl. 11. fig. 1 represents the living animal from a drawing made by G. v. Frauenfeld. The generic distinction of *Triboniophorus* from *Aneitea* is called in question, the distinctness of the dorsal furrow and the exact shape of the jaw being subject to gradual differences.

Succinea oblonga, Drap., found alive in very dry localities. Kobelt, Nachr. mal. Ges. ii. pp. 182, 183.

Succinea rutilans, sp. n., Blanford, J. A. S. B. xxxix. p. 23, pl. 3. fig. 23, Cherra Punji.

Succinea (Lithotis) tumida, sp. n., with a var. *subcostulata*, Blanford, l. c. p. 23, pl. 3. fig. 24, Singhar, British India.

Succinea mascarensis, sp. n., Nevill, J. A. S. B. xxxix. p. 414, Bourbon. Allied to *S. striata*, Krauss.

Succinea explanata, Gould, lives on the trunks of trees in the Sandwich Islands; a new genus, *Catinella*, is proposed for it, but no distinctive characters given by Pease, J. de Conch. xviii. p. 89.—*Catinella rubida* and *Succinea elongata*, spp. nn., Pease, ibid. pp. 96, 97, Kauai, Sandwich Islands; the last at an elevation of 4000 feet.—*Succinea paulucciae*, sp. n., Gassies, J. de Conch. xviii. p. 140, New Caledonia.

Succinea nuttalliana, Lea; photograph of dentition, Binney and Bland, Ann. Lyc. N. York, ix. 1870, p. 281.—*S. effusa*, Shuttl., dentition figured by the same, Am. J. Conch. vi. pl. 9. fig. 15.

LIMNOPHILA.

AURICULIDÆ.

Carychium minimum var. *curtum*, n., Colbeau, Ann. mal. Belg. iii. (1868) p. 101, pl. 2. fig. 8, Belgium.

Scarabus maurulus and *crosseanus*, spp. nn., Gassies, J. de Conch. xviii. pp. 143, 144, New Caledonia.—*Pythia pollux* (Hinds) described anew by Mousson, ibid. p. 133, Fiji Islands.

Auricula (Cassidula) intuscarinata, sp. n., Mousson, J. de Conch. xviii. p. 132, pl. 7. fig. 9, Fiji Islands.—*Aur. (C.) crassiuscula* var. *vitiensis*, id. ibid. p. 131.

Melampus avenaceus, sp. n., Mousson, l. c. p. 134, Ovalau, Fiji Islands.

Melampus bidentatus (Say), photograph of its dentition by Binney and Bland, Ann. Lyc. N. York, ix. p. 286.

LIMNÆIDÆ.

W. H. DALL, after reviewing all accessible information concerning the dentition and other anatomical characters of the genera and subgenera, from his own observations and various authors, proposes the following arrangement of this family:—

Subfamily LIMNÆINÆ.

Gen. *Limnæa*, subgen. *Radix*, Montf., *Bulimnæa*, Hald., *Limnophysa*, Fitz., *Acella*, Hald. (rhachidian tooth, pl. 2. fig. 13), and *Limnæa* proper, type *stagnalis*, L.

Gen. *Amphipeplea*, Nilss.

Gen. *Erinna*, H. et A. Adams.

Gen. *Strebelia*, Crosse and Fischer, = *Physella*, Pfr., not Hald. [This is supposed to be a terrestrial shell by Dr. L. Pfeiffer and others.]

Subfam. PLANORBINÆ.

Gen. *Planorbis*, subgen. *Taphius*, Ad., *Helisoma*, Swains., *Planorbis* proper (type *corneus*, L.), *Planorbella*, Hald., *Adula*, Ad., *Menetus*, Ad., *Gyraulus*, Ag. (type *albus*, Müll.), *Bathyomphalus*, Ag., and *Anisus*, Fitz.

Gen. *Segmentina*, Flem., subgen. *Planorbula*, Hald., type *armigera*, Say, and *Segmentina* proper.

? Subfam. CAMPTOCERINÆ.

Gen. *Camptoceras*, Bens.

Subfam. POMPHOLIGINÆ.

Gen. *Pompholyx*, Lea.

Gen. ? *Choanomphalus*, Gerstf. Animal unknown.

Gen. *Carinifex*, Binn.

The *Ancylidæ*, including also *Gundlachia* and ? *Latia*, the *Physidæ*, and the *Chilinidæ* elevated to the rank of distinct families.

Chilina ovalis, Sow. Lingual dentition described and figured by Dall, Ann. Lyc. N. York, ix. p. 347.

Pseudochilina, n. g. Shell thin, covered with a rough fibrous epidermis, spire elevated, acute. — *Ps. limnæformis*, sp. n., Chili. The broad plicate columella distinguishes it from *Limnæa*. Dall, l. c. p. 357.

Limnæa, group *Gulnaria*, Leach, or *Radix*, Montf. The European species of this group have been carefully revised by Dr. W. KOBELT. He remarks that none of the species or true varieties are rare in their localities, and that every so-called species which is said to occur in but few specimens is to be suspected; similar conditions may give similar features to different species, and so cause *corresponding varieties* of distinct species, which live in the same locality. Among the more striking of such cases are the lacustrine varieties, living in large inland lakes, and distinguished by a more solid shell and shortened spire from the types of their species. The author gives the following species and varieties:—

1. *auricularia*, Drap., type pl. 1. fig. 1, var. *costellata* fig. 2, var. *ampla*, Hartm., fig. 3; *monardii*, Hartm., pl. 2. fig. 4, is rather an individual form (as also var. *collisa*, Moq.-Tand., and *gibbosa*), var. *minor* fig. 5, var. *obtusa* fig. 6, var. *tumida*, Held, fig. 7, var. *ventricosa*, Hartm., pl. 3. fig. 8.

2. *vulgaris* (Rossm., not C. Pf.) = *acutalis*, Morelet, *acuta*, Jeffr., *biformis*, Küster [and *lagotis*, Schranck, the oldest name], type pl. 3. fig. 9, var. *alata* fig. 10.

3. *ovata*, Drap., typical form pl. 3. fig. 11, var. *inflata* pl. 4. fig. 12, var. *ampullacea*, Rossm., fig. 13, var. *dickinii* fig. 15. Mal. Bl. xvii. pp. 145–166, with 4 plates.

Limnæa, sp., between *stagnalis* and *auricularia*, probably *stagn.* var. *lacustris*, from the Walchensee, Bavaria. Walser, Nachrichtsbl. mal. Ges. ii. p. 94.

Limnæa rosea, v. Gallenstein, is to be regarded as a lacustrine variety of *vulgaris*, Rossm. Kobelt, Nachrichtsbl. mal. Gesellsch. ii. p. 127, afterwards given as a variety to *L. peregra*. Mal. Bl. xvii. p. 180.

Limnæa glabra, Müll. [*elongata*, Drap.], very small, only 5 millims. long. V. d. Broeck, Ann. mal. Belg. iv. (1869) p. 86, pl. 2. fig. 1.—*L. elongata*, Drap., and *palustris*, Müll., var. from Hamburg described by H. Strebel, Nachr. malak. Ges. ii. p. 124.—*L. fusca*, C. Pfr., var. *gracilis*, Pirona, from Friuli by E. de Betta, Malac. Veneta, p. 124.

Limnæa martorelli, sp. n., Bourguignat, R. Z. 1870, p. 167, Estanque de Bag-nolas in Catalonia.

Limnæa berlani, sp. n., Bourguignat, Ann. Mal. p. 37, mouth of the Danube.

Limnæa turgidula, *compacta*, and *ambigua*, spp. nn., Pease, Am. J. Conch. vi. pp. 5, 6, pl. 3. figs. 3, 5, 6, Sandwich Islands. The author gives in the same paper a list of the species of *Limnæa* inhabiting the Sandwich Islands, containing the following described species:—*L. oahuensis*, Souleyet, = *affinis*, Souleyet, = *volutata*, Gould; also *reticulata* (Gould), *umbilicata* (Mighels), and *producta* (Mighels); finally *turgidula*, *compacta*, and *ambigua*, spp. nn. He states that sinistral and dextral specimens are found in company with each other, the latter being rare in all localities. This confirms an opinion published by the Recorder in Ann. N. H. L. c. pp. 4-6; the new species figured, pl. 3.

Pompholyx, Lea. The external and anatomical characters of this genus are fully described from specimens found in Clear Lake, and belonging probably to *P. leana*, H. & A. Adams, var. *solida*. The principal of them are:—buccal plate subcordiform; lateral jaws absent; genitalia on the left side (in *Limnæa* on the right); tentacles stout, cylindrical, slightly globose at the tips; eyes sessile on the front of the head near the inner bases of the tentacles; in some individuals an aggregation of pigment-cells near the tips of the tentacles, which has been taken for a second pair of eyes, but it is nearly or entirely absent in others. Dall, Ann. Lyc. N. H. ix. pp. 333-340, pl. 2. figs. 1-11; dentition figured, p. 344.

Physa fontinalis, var. *aplexoides*, n., Colbeau, Ann. mal. Belg. iii. (1868) p. 102, pl. 2. fig. 11, Vilverde, in Belgium. Another var., *curta*, of the same species, by V. d. Broeck, Ann. mal. Belg. iv. (1869) p. 90, pl. 2. fig. 5, St. Gilles, in Belgium.

Physa gibberula, sp. n., Mousson, J. de Conch. xviii. p. 130, Fiji Islands. Allied to *Ph. sinuata* (Gould).

Costatella, new subgenus for *Physa costata*, Newcomb, on account of the ribbed shell. Dall, l. c. p. 355.

Planorbis. Ficinus has made anatomical researches which show a considerable difference in the male organ of several of our common European species of this genus. In *Pl. vortex*, *leucostomus*, *spirorbis*, *albus*, and *contortus* it is furnished with a very elegant calcareous sting, which is not thrown away as the sagitta of *Helix*. *Planorbis corneus*, *nitidus*, and *complanatus*, Drap. [*fontanus* (Lightf.)], want this organ. The first of them is further distinguished by a well-developed albuminous gland, the two latter by cæcal appendices on the corpus cavernosum. The author proposes, but with some hesitation, a new generic name, *Appendiculata*, for these two last-named species. Z. ges. Naturw. xxx. 1867, pp. 363-367.

Planorbis corneus, var. *bicolor*, and var. *microstoma*, nn., Colbeau, Ann. mal. Belg. iii. (1868) p. 102, pl. 2. figs. 9, 10, Belgium.

Planorbis corneus (L.). Inflated variety called formerly by Charpentier *etruscus*, Ziegl., then *meridionalis*, and *Pl. similis*, Bielz, which is the true *etruscus* of Ziegler, living together at Casaleone. Betta, Moll. prov. Veron. pp. 87, 88.

Planorbis mabilli, sp. n., Bourguignat, R. Z. 1870, p. 28, Angy, department of the Oise. Allied to *corneus* (L.).

Planorbis riparius, Westerlund, and *acies* (Mhfld.), their differences from allied species, and their occurrence in Northern Germany, Reinhardt, Nachr. mal. Ges. ii. pp. 6, 7, and 21-25.—*Pl. vortex*, var. *discoides*, v. n., Reinhardt, ibid. p. 24. Westerlund gives a note concerning his determination of *Pl. discus* (Parreyss), ibid. p. 57.

Planorbis sudanicus, sp. n., Bahr-el-ghazal system of the White Nile, allied to the American group of *Pl. guadelupensis*. Martens, Mal. Bl. xvii. p. 35.

Planorbis fouqueti, sp. n., J. de Conch. xviii. p. 146, New Caledonia.

Planorbis trivolvris, Say. Photograph of its dentition by Binney and Bland, Ann. Lyc. N. York, ix. p. 292.

Carmifex newberryi, Lea. Lingual dentition described and figured by Dall, Ann. Lyc. N. York, ix. p. 345, and pl. 2. fig. 14.

Ancylus fluviatilis, var. *dimidiatus*, *rivularis*, *lepidus*, and *depressus*, v. n. Colbeau, l. c. p. 103, pl. 2. figs. 12-15.

Poeysia, Bourg., is supposed to be the young state of *Gundlachia*, and *Ancylus cumingianus*, Bourg., that of *Latia*, by Dall, l. c. p. 358.

THALASSOPHILA.

Siphonaria. The anatomy of this genus has been the subject of researches by WM. DALL, chiefly in *S. tristensis* (Sow.). He found several differences from the previous description by Quoy and Gaimard; but the chief systematic characters, as the united sexes, the lungs, and the radula agreeing with that of *Helix* and *Limnæa* in the principal features, are confirmed by his researches. He divides the genus into two sections:—

A. *Siphonaria* proper. Shell solid, porcellaneous, radiately ribbed, apex central or subcentral. *S. gigas*, Sow., *sipho*, Sow., and *alternata*, Say. Most of the species tropical.

B. *Liriola*. Shell thin, horny, smooth, or finely striated; apex marginal or submarginal, twisted to the left in most of the species. *S. thersites*, Carp., the northernmost species, occurring at Sitka and Alaska; *S. tristensis*, Sow., *lessoni*, Blainv., and *peltoides*, Carp., pl. 4. fig. 11, extending from Monterey to the Galapagos, and including perhaps as varieties *Nacella subspiralis*, Carp., and *N. vernalis*, Dall. Most of the species are extratropical. *Anisomyon*, Meek, 1860, appears to be a genus allied to *Siphonaria*. Dall, Am. J. Conch. vi. pp. 30-41, pls. 4, 5.

Gadinia, Gray. The anatomical examination of a west-coast species, *G. reticulata*, Sow., by W. DALL proves that this genus is a true pulmonate, breathing air by means of a lung, and unprovided with gills of any kind. The anatomy shows affinity with the *Auriculidæ*; and the dentition has relations with that of *Siphonaria*. The rostrum is bifid and infundibuliform.

The known species are:—*G. afra* (Gmel.), Western Africa; *garnotii*

(Payr.), Mediterranean; *stellata*, Sow., Central America and California; *peruviana*, Sow., Cobijs; *costata*, Krauss, South Africa; *conica*, Angas, Port Jackson; *angasi*, sp. n., here described, also Port Jackson; *reticulata*, Sow., California, not Chile; *carinata*, sp. n., here described and figured, Aspinwall; and *excentrica*, Tiberi, Mediterranean. Dall, *l. c.* pp. 8-22, pl. 2.

Gadina excentrica, Tiberi, and *G. lateralis*, Requier, are varieties of the same species. Weinkauff, Bull. mal. Ital. iii. p. 90. Appellius suggests that both may be varieties of *G. garnotii* (Payr.), *ibid.* p. 91, footnote.

PULMONATA OPERCULATA.

LACAZE-DUTHIERS asserts that in the arrangement of the nervous system also *Cyclostoma* (probably the Pulmonata operculata generally) agrees more with the Pectinibranchiata than with the Helicidæ. C. R. 1870, p. 44.

CYCLOPHORIDÆ (CYCLOTACEA).

Aperostoma bartletti, sp. n., H. Adams, P. Z. S. 1870, p. 375, pl. 27. fig. 1, Eastern Peru.

Cyobtus taiwanus, sp. n., H. Adams, *l. c.* p. 378, pl. 27. fig. 11, Taiwan, Formosa.

Cyathopoma milium, Bens., recognized. Blanford, Ann. N. H. (4) vi. p. 370.

Pterocyclos hainanensis, sp. n., H. Adams, *l. c.* p. 8, pl. 1. fig. 16, Hainan Island.

[*Pterocyclos* ?] *Cyclostoma brazieri*, sp. n., Upolu, Navigators' Islands. Cox, P. Z. S. 1870, p. 85.

Spiraculum gardeni, Bens., Theobald, J. A. S. B. xxxix. p. 399, pl. 18. fig. 6, Valley Sittong, near Tongu.

[*Cyclophorus*] *Cyclostoma vieillardii*, sp. n., Gassies, J. de Conch. xviii. p. 144, New Caledonia.

Cyclophorus diatretus, var. *intercostata*, Mousson, J. de Conch. xviii. p. 179, Fiji Islands.

Cyclophorus leai, Tryon, 1869 = *foliaceus* (Chemn. 1786), Stoliczka, P. As. Soc. Beng. 1870, p. 87. Tryon defends, however, the distinctness of his *Cyclophorus leai* from the true *foliaceus* (Chemnitz), admitting that this latter may be an allied species from the same islands, and that the *foliaceus* figured by Reeve is identical with his *C. leai*. Am. J. Conch. vi. pp. 25, 26.

Jerdonia phayrei, sp. n., Theobald, *l. c.* p. 396, Shan States, valley of the upper Salwin river.

PUPINEA.

Megalomastoma bituberculatum, Sow. Jaw and dentition described by Binney and Bland, Am. J. Conch. vi. pp. 213, 214, with a woodcut.

Hargravesia, gen. nov. Testa subovata, polita, callo nitido obducta; apertura circularis; peristoma simplex, subincrassatum, margine dextro juxta insertionem canaliculato.—*H. polita*, sp. n., H. Adams, P. Z. S. 1870, p. 795, pl. 48. fig. 22, Solomon Islands.

Registoma brazieri, sp. n., Crosse, J. de Conch. xviii. p. 250, New Hebrides.

DIPLOMMATINACEA.

Diplommatina salviniana, *pupæformis*, and *affinis*, spp. nn., Theobald, J. A. S. B. xxxix. p. 398, Shan States.—*D. scalaroides*, sp. n., Theobald, *ibid.* p. 399, pl. 18. fig. 5, Mandalay, Burmah.

Diplommatina wisemani and *brazieri*, spp. nn., Cox, P. Z. S. 1870, p. 84, Christoval, Solomon Islands.

Diplommatina, subgenus *Diancta*, Martens. Mousson comprises under this name all species in which the whorl before the last exhibits some irregularity. *D. (D.) pomatiæformis*, *subregularis*, *godeffroyana*, *ascendens*, *tuberosa*, and *quadrata*, spp. nn., Mousson, J. de Conch. xviii. pp. 180–187, pl. 8. figs. 1–5, Fiji Islands.

Diplommatina, subgenus *Moussonina*, Semper. *D. fuscula*, sp. n., Mousson, l. c. p. 188, pl. 8. fig. 9, Viti-Levu and Ovalau.

Diplommatina martensi, H. Adams, comes from Avolau [Ovalau], Fiji Islands; *Palaina cori*, H. Adams, from Norfolk Island. Brazier, J. de Conch. xviii. p. 84.

Alycæus bifrons, *cucullatus*, and *feddenianus*, spp. nn., Theobald, l. c. pp. 396, 397, pl. 18. figs. 1, 2, 4, Shan States. The latter belongs to the group *Dioryx*.—*A. graphicus*, Blauf., new variety of it, Theobald, *ibid.* p. 398, pl. 18. fig. 3.

Alycæus globosus, sp. n., H. Adams, l. c. p. 794, Sarawak.

CYCLOSTOMIDÆ.

Cyclostoma (Otopoma) hinduorum (Blanford) fully described and figured by Blanford, J. A. S. B. xxxix. p. 12, pl. 3. fig. 6. Kathiawar, British India. It is the most eastern of the genus.

Chondropoma letum, sp. n. (Gutierrez, MS.), Pfr. Mal. Bl. xvii. p. 89, Cuba.

Pomatias schmidtii, sp. n., E. de Betta, Malacol. Venet. p. 126, Friuli. The author himself thinks it may probably be a variety of *T. scalarinus*, Villa. *P. philippianus*, Gredler, shortly characterized by the same, p. 125.

Pomatias philippianus, Gredler, var. *pachystoma*, and var. *decipiens*, Monte Baldo. Betta, l. c. pp. 105–107.

Omphalotropis rubens (Q. & G.). Two varieties of it on Bourbon, *O. borbonica*, H. Adams, and *picturata*, H. Adams, also from Bourbon, described by Nevill, J. A. S. B. xxxix. pp. 415, 416. *O. borbonica* and *O. expansilabris*, Pfr., stated to live in damp woods, the latter at considerable elevation, by the same, *ibid.*

Realka, subgenus *Omphalotropis*, Pfr. *R. ingens*, *costulata*, *circumlineata*, *subsoluta*, *longula*, spp. nn., Mousson, J. de Conch. xviii. pp. 189–192, figured (except the first and last) pl. 7. figs. 10–12. Fiji Islands.

TRUNCATELLIDÆ.

Acme. The anatomy of this little animal is fully given by Ferd. Sordelli from specimens of *A. lineata* and also *polita*. The dentition and the genital apparatus agree with *Cyclostoma*; the otoliths are numerous, as in *Pomatias*. Atti Soc. Ital. xiii. fasc. 1; abstract in Bull. mal. Ital. iii. pp. 58, 59.

Acicula veneta, proposed by Pirona in 1865, now established as a distinct species by E. de Betta, Malac. Venet. p. 89, Verona and Belluno. The author suggests that the figure given by L. Pfeiffer in the new edition of Chemnitz, Cyclostomacea, pl. 30. figs. 29-31, for *spectabilis* (Rossm.) represents this species. The same is mentioned as *Acicula spectabilis* (Rossm.)[?], from Pirona, Monte Baldo, and Udine, by Betta, Moll. Veron. pp. 102, 103.

Truncatella arcasiana, Crosse, figured, J. de Conch. xviii. pl. 7. fig. 13, Fiji Islands (cf. Mousson, ibid. p. 196).—*T. turricula* and *funiculus*, spp. nn., Mousson, ibid. pp. 196, 197, Fiji Islands.

ASSIMINEÆ.

Acmella, Blanf., elevated to generic rank. Testa ovata, cornea, apertura ovata, peristomate obtuso; operculum corneum, tenuissimum, paucispirale, nucleo excentrico, sinistrali. Animal *Assimineæ* simile, proboscide brevi, tentaculis brevibus, obtusis, oculos insuper haud procul ab extremitatibus gerentibus, pede mediocri ovato. *A. tersa*, Bens., lives in moist places, near small streams, but not upon their edges, at a height of 4000 feet above the sea, in the Khasi Hills. Lingual dentition not yet ascertained. The author admits that it may be allied to *Assiminea*. Blanford, Ann. N. H. (4) vi. pp. 368-370. (See Zool. Rec. vi. p. 581.)

HELICINIDÆ.

Helicina gallina and *mediana*, spp. nn., Gassies, J. de Conch. xviii. p. 145, New Caledonia.—*H. mariei*, *porphyrostoma*, *mouensis*, and *benigna*, spp. nn., Crosse, ibid. pp. 244-246, New Caledonia.

Helicina tectiformis, *interna*, and *semperi*, spp. nn., Mousson, ibid. pp. 199-202, pl. 8. figs. 6-8, Fiji Islands. Some remarks upon varieties of known species from the same islands by Mousson, ibid. pp. 198, 200, 203.

Helicina mangoensis, sp. n., Sowerby, P. Z. S. 1870, p. 250, Mango Island, Fiji.

Helicina angulata, Sow., and *H. brasiliensis*, Gray, both from Rio Janeiro, and probably not distinct. Hidalgo, J. de Conch. xviii. p. 69.

Helicina occulta, Say, found living at Whitefish Bay, Wisconsin, by E. R. Leland; its dentition photographed by Binney and Bland, Ann. Lyc. N. York, ix. pp. 287-290; it differs somewhat from that of *H. orbiculata* given by Troschel.

Georissa. The identity of this genus with *Hydrocena*, Parreyss, in its original circumscription, is admitted by Blanford, Ann. N. H. (4) vi. p. 368 (see Zool. Rec. vi. p. 582).

Hydrocena brevissima, sp. n., Mousson, l. c. p. 194, Vanua-Valabo, Fiji Islands. It is not ascertained whether it really belongs to that genus.

PROSERPINIDÆ.

Cyane, gen. nov., near *Proserpina*, base of the columella truncate instead of being furnished with a spiral plait; no palatal parietal laminae. *C. blandiana*, sp. n., H. Adams, P. Z. S. 1870, p. 376, pl. 27. f. 2, Eastern Peru.

SOLENOCONCHÆ.

Dentalium gracile, sp. n., Jeffreys, Ann. N. H. (4) vi. p. 74, Mediterranean and Vigo Bay.

LAMELLIBRANCHIATA.

LACAZE-DUTHIERS, studying the organization of *Aspergillum*, found by injection a free communication between the pericardial cavity, the so-called organ of Bojanus, and the network of veins in the posterior part of the visceral mass, a communication which has been denied lately by LANGER from observations on *Anodonta*. C. R. Feb. 1870, and R. Z. 1870, p. 68.

INCLUSA.

PHOLADIDÆ.

Pholas. An account of L. Spengler's monograph (1792) is given by Mörch, Mal. Bl. xvii. p. 102.

Teredo. The muscle between the rudimentary valves is proved to be homologous to the posterior adductor muscle of the ordinary Bivalves with two adductors, by its relation to the position of the intestine; it is the posterior part of this animal which is enormously elongated in comparison with normal Bivalves. Lacaze-Duthiers, C. R. Jan. 1870, p. 102.

Teredo chlorotica, sp. n., Gould, Invert. Mass. p. 34, woodcut, Massachusetts.

GASTROCHÆNIDÆ.

Gastrochæna. An account of L. Spengler's papers concerning this genus is given by Mörch, Mal. Bl. xvii. pp. 101 and 103.

Aspergillum javanicum. The anatomy has been studied by LACAZE-DUTHIERS, who came to the conclusion that it agrees in all essential points with the other Lamellibranchiate Bivalves. The upper [anterior] adductor muscle has disappeared; and in consequence the branchial ganglions touch the rectum. The calcareous tube is an adventitious formation, analogous to the calcareous deposit in the holes made by *Teredo*, and not homologous with the rudimentary valves; the mantle does not adhere to the tube; and its edges are connate for almost their whole length. The young are contained within the mantle, as in *Ostrea* and *Teredo*. C. R. Feb. 1870, pp. 268-271.

MYIDÆ.

Mya. An account of L. Spengler's monograph of this genus is given by Mörch, Mal. Bl. xvii. p. 105.

Corbula sulculosa, sp. n., H. Adams, P. Z. S. 1870, p. 6, pl. 1. f. 2, Red Sea.

Corbula erythrænsis [barbarous !, *erythræa*], sp. n., H. Adams, *l. c.* p. 789, pl. 48. fig. 2, Red Sea.

Neæra (*Cordomya*) *pulchella*, sp. n., H. Adams, *l. c.* p. 789, pl. 48. f. 4, Red Sea.

ANATINIDÆ.

Anatina radiata, Marav. 1840, = *Neæra costellata*, Phil., Benoit et Aradas, Atti Soc. Ital. xii. p. 601.

Thracia pubescens (Pult.), var. *solida*, Chiareghini, MS., twice as large as ordinarily, and *Th. convexa* (Wood) = *hiatelloides* (Brusina, 1866), both in the Adriatic. Brusina, Chiaregh. Conch. pp. 34, 51, and 53.

Eucharis angulata, sp. n., H. Adams, P. Z. S. 1870, p. 789, pl. 48. f. 3, Red Sea.

Verticordia granulata, Seguenza, dredged in a recent state in the Ægean Sea by Capt. Spratt. Jeffreys, Ann. N. H. (4) vi. p. 73, and Bull. mal. Ital. iii. pp. 21 and 43.

Hippagus, Lea. Jeffreys thinks that this genus does not belong in this family, but to *Crenella*, among the Mytilidæ. Ann. N. H. (4) vi. p. 73.

SOLENIIDÆ.

Solen (L.). An account of Lor. Spengler's monograph (1794) is given by Mörch, Mal. Bl. xvii. pp. 108–110.

Macha watsoni, sp. n., Tryon, Am. J. Conch. vi. p. 23, pl. 1. f. 2, China.

CARDIACEA.

TELLINIDÆ.

Soletellina boeddinghausi, sp. n., Lischke, Mal. Bl. xvii. p. 26, Nangasaki.

Tellina. An account of L. Spengler's monograph (1798) is given by Mörch, Mal. Bl. xvii. pp. 114–119.

Tellina inflata, Chemn., *oblonga*, Gmel., *vitrea*, Gmel., *nivea*, Chemn., and *hyalina*, Gmel., are doubtful species described and figured in the old work of Chemnitz, to which the attention of conchologists is called by E. Römer, Mal. Bl. xvii. pp. 12–14.

Tellina oudardi, Payr., is a doubtful species; *T. pygmæa*, Forbes & Hanley, is different from *pusilla*, Philippi, and only a variety of *distorta*, Poli. Wein-kauff, Bull. mal. Ital. iii. p. 20.

Tellina (*Tellinella*) *virgulata*, sp. n., H. Adams, P. Z. S. 1870, p. 6, pl. 1. f. 3, Red Sea; this species is called *erythrænsis*, p. 793, the former being preoccupied.

Tellina (*Peronæa*) *conradi*, sp. n., Tryon, Am. J. Conch. vi. p. 24, pl. 1. fig. 5, locality not indicated.

Tellina (*Peronæoderma*) *simplex*, sp. n., H. Adams, *l. c.* p. 789, pl. 48. f. 5, Red Sea.

Tellina (*Peronella*) *pura*, *scitula*, *erythrænsis* [*erythræa*], *triradiata*, and *lactea*, spp. nn., H. Adams, *l. c.* pp. 789, 790, pl. 48. f. 6–9, Red Sea.

Tellina (*Arcopagia*) *isseli* and *savignyi*, spp. nn., H. Adams, *l. c.* p. 790, pl. 48. f. 10, 11, Red Sea.

Tellidora pusilla, sp. n., H. Adams, *l. c.* p. 6, pl. 1. fig. 4, Red Sea.

Macoma sulcosa, sp. n., Conrad, Am. J. Conch. vi. p. 74, pl. 1. f. 3, Raritan and Delaware Bay.

Strigilla producta, sp. n., Tryon, ibid. p. 24, pl. 1. f. 4, Jamaica.

Lucinopsis undata (Penn.) described and figured by L. Pfeiffer in the new edition of Chemnitz, Veneracea, pp. 117-120, pl. 31. figs. 4-8.

Lucinopsis (Lajonkairia) elegans, sp. n., H. Adams, l. c. p. 6, pl. 1. f. 5, Red Sea.

Donax. Dr. E. RÖMER gives a very careful monograph of this genus in the new edition of Martini and Chemnitz. Sixty-nine species are described and figured, only two being new. They are disposed in seven sections, which are carefully characterized.

A. Margin crenulate.

1. *Hecuba*, Schum., type *D. scortum*, L.; 2. *Chion*, Scop., type *D. rugosus*, L.; 3. *Serrula*, Mörch, type *trunculus*, L.; 4. *Machærodonax*, n., type *D. scalpellum*, Gray.

B. Margin entire.

5. *Latona*, Schum., type *D. cuneatus*, L.; 6. *Capsella*, Gray, type *D. vinaceus* (Gmel.)=*complanatus*, Mont.; 7. *Heterodonax*, Mörch, type *D. bimaculatus* (L., as *Tellina*).—New are *D. siliqua*, sp. n., p. 54, pl. 9. figs. 15-17, *D. lepidus*, sp. n., p. 96, pl. 17. figs. 7-9. Localities unknown.

Hemidonax, new section of the genus *Donax*, proposed by Mörch for a shell hitherto placed in the genus *Cardium* as *C. donaciforme*, Schröter, Mal. Bl. 1870, p. 121.

Donax (Serrula) pictus, sp. n., Tryon, Am. J. Conch. vi. p. 23, pl. 1. fig. 1, locality unknown. (This is, according to Dr. Mörch, the type of *Hemidonax* mentioned above.)

Donax venusta, Poli, is a variety of *trunculus*, L., but distinct from the English *atlantica*, Hidalgo,=*anatina*, Forbes & Hanl.,=*vittata*, Jeffreys, said not to be=*anatina*, Lam. Weinkauff, Bull. mal. Ital. iii. pp. 18, 19.

Semele macandreeæ, sp. n., H. Adams, l. c. p. 6, pl. 1. f. 6, Red Sea.

Semele junonia, sp. n., Verrill, Am. J. Sc. xix. p. 217, La Paz, California.—*S. formosa* (Sow.) described by the same, ibid. p. 218.

MACTRIDÆ.

Macra (L.). An account of L. Spengler's monograph (1802) is given by Mörch, Mal. Bl. xvii. pp. 122-124.

VENERIDÆ.

L. PFEIFFER proceeds, in the continuation of Chemnitz, to give a partial monograph of the family Veneridæ; the part under consideration, section 59 of the whole work, contains the genera *Sunetta*, *Dosinia*, *Cyclina*, *Lucinopsis*, and parts of *Cytherea*, *Venus*, and *Tapes*.

Dosinia corculum, China Sea, *nuculoidea*, Indian Ocean, *cæscia*, locality unknown, *cyclas*, Brazil, *physema*, Japan, and *areolata*, Australia, spp. nn., E. Römer, Mal. Bl. xvii. pp. 1-9.

Callista pollicaris (Carp.) = *Dione prora*, var. (Reeve, Conch. Ic. f. 45, not Conrad), described, Verrill, Am. J. Sc. xix. p. 219, La Paz, California.

Cytherea deshayesi, new name for *crocea* (Desh), because there is a *Circe crocea*, Gray. Pfr. l. c. p. 74.

Tivela elegans, sp. n., Verrill, l. c. p. 220, California.

Sunetta. Nine species described and figured, E. Römer, Monogr. Venus, vol. ii. pp. 1-15, pl. 1-4.

Venus isocardia, sp. n., Verrill, l. c. p. 221, La Paz, California. Allied to *V. rugosa*.

Chione pulchella, sp. n., H. Adams, P. Z. S. 1870, p. 7, pl. 1. fig. 7, Red Sea.

Chione tumens, sp. n., *Ch. succincta* (Val. 1833) = *leucodon* (Sow. 1835) = *californiensis* (Brod. 1835, not Conrad) = *nuttallii* (Conrad, 1837), and *Ch. undatella* (Sow. 1835) = *neglecta* (Gray, 1839) = *subrostrata* (Reeve, not Lam.), described by Verrill, l. c. pp. 222-224, all from La Paz, California.

Tapes. Sect. i. *Textrix*, Römer: *T. carpenteri*, sp. n., locality unknown, and 15 other species. Sect. ii. *Parembola*, Römer, with 23 species figured. E. Römer, Monogr. Venus, vol. ii. pp. 17-64, pl. 5-23.

Tapes letus (Poli), var. *polyxena* (Chiareghini, MS.) = *T. höbertianus* (Brusina, 1864) = *T. aureus*, var. *quadrata*, Jeffreys. Brusina, Chiaregh. Conch. p. 77.

Tapes ducalis, sp. n., Römer, Mal. Bl. xvii. p. 9, China.

Tapes quadriradiata [-us], Pfr. l. c. p. 200, pl. 32. fig. 6, Philippines.—*T. inflata* [-us], Desh., ibid. p. 210, pl. 34. fig. 1, Ceylon.

Hemitapes dohrni, sp. n., Römer, Mal. Bl. xvii. p. 9, Philippines.

Tapes (*Hemitapes*) *apaturia*, Römer, Pfeiffer, l. c. p. 196, pl. 25. figs. 10, 11.

Cypriocardia kihophagella, Lam., = *renieri* (Nardo), = *dentatus* (Renier). Brusina, Chiaregh. Conch. p. 108.

Coralliophaga striolata, sp. n., H. Adams, P. Z. S. 1870, p. 791, pl. 48. fig. 12, Red Sea.

PETRICOLIDÆ.

Petricola pholadiformis, Lam., a sketch of the two siphons of the living animal. Gould, Invert. Mass. p. 92.

CYRENIDÆ.

Corbicula ammiralis and *gubernatoria*, New Caledonia, *delessertiana*, Smyrna, *imperialis*, Pondicherry, *baronialis*, Australia, *consularis*, Malacca, *episcopalis*, Cambodja, spp. nn., Prime, Ann. Lyc. N. York, ix. 1870, No. 2.

Cyrena tribunalis, Ecuador, and *amazonica*, Amazon River, spp. nn., Prime, l. c.

Cyclas calyculata, var. *tenstedti*, n., Colbeau, Ann. mal. Belg. iii. (1868) p. 105, pl. 4. fig. 4, Belgium.

Cyclas pisidioides, Gray, found on the island of Föhr, and described by E. Friedel. Mal. Bl. xvii. p. 67.

Sphærium hispanicum, sp. n., Bourguignat, R. Z. 1870, p. 169, Madrid.

CARDIIDÆ.

Cardium. An account of Lor. Spengler's monograph (1808) is given by Mörch, Mal. Bl. xvii. pp. 119-122.

Cardium edule, L., var. *clodiense*, Renier, and var. *libenicense*, n., shortly characterized by Brusina, Chiaregh. Conch. p. 69.

Cardium edule, L., and *rusticum*, Lam., non Linné, or *lamarckii* of Reeve, var. *pumila*, n., both in the same brackish water on the shores of the Baltic in Eastern Holstein, without transition from one to the other. Friedel, Mal. Bl. xvii. p. 56.

Liocardium mortoni (Conrad), a sketch of the living animal. Gould, Invert. Mass. p. 143.

Papyridea bullata, Swains., var. *californica*, n., Verrill, Am. J. Sc. ⁽⁹⁹⁾ ~~xix~~. p. 225, La Paz, California.

ISOCARDIIDÆ.

Isocardia cor (L.). Very young individuals have not the fine bristly epidermis of the old ones, and swarm on the surface of the mud in deep water, while the adults bury themselves in it; they have been described by former naturalists as distinct species and even genera, namely *Kellia abyssicola* (Forbes), *Venus miliaris* (Philippi), and *Kelliella* (Sars). Jeffreys, Ann. N. H. (4) v. p. 441.

SARS describes his new genus *Kelliella* fully, and persists in thinking it distinct, and enumerates as differences from *Isocardia* the want of the brown ciliated epidermis, the glossy surface of the shell, the smaller and less prominent umbones, the well-defined and not sunken lunula, the ligament being internal, and the teeth of the hinge lying in one line, the want of any lateral teeth, the presence of some tentacles at the hinder part of the mantle, the presence of only one siphonal opening, the small palpi, and the unequal size of the gills. Bidr. Christ. Faun. pp. 89-97, pl. 12. figs. 11-15, and pl. 13.

CHAMIDÆ.

Chama ambigua, *dunkeri*, *semipurpurata*, and *retroversa*, spp. nn., Lischke, Mal. Bl. xvii. pp. 27, 28, all from Nangasaki.

MYTILACEA.

LUCINIDÆ.

Lucina fieldingi, *concinna*, *elegans*, and (*Cyclas*) *macandreae*, spp. nn., H. Adams, P. Z. S. 1870, p. 791, pl. 48. figs. 13-15, Red Sea.

Loripes decussata [-us], sp. n., H. Adams, l. c. p. 7, pl. 1. fig. 8, Red Sea.

Loripes hirta [-us], sp. n., H. Adams, l. c. p. 792, Red Sea.

Loripes edentuloides, sp. n., Verrill, Am. J. Sc. xix. p. 226, La Paz, California.

Avinus eumyrius, sp. n., Sars, Bidr. Christ. Faun. p. 87, pl. 12. figs. 7-10, Vallö in Christianiafjord, 200-230 fathoms, Hasdangar-fjord, 450 fathoms, and Lofoten Islands, 100-300 fathoms.

UNGULINIDÆ.

Mysia tumida, sp. n., H. Adams, P. Z. S. 1870, p. 791, pl. 48. fig. 6, Red Sea.

GALFOMMIDÆ.

Galeomma turtoni, Sow., = *Tellina aperta* (Chiaregh. MS.), Renier, 1804, = *Imisia bisulcata*, Renier, 1807. Brusina, Chiaregh. Conch. pp. 54, 55

ASTARTIDÆ.

Astarte lutea, sp. n., Perkins, P. Bost. Soc. xii. p. 139, New Haven.

Crassatella (*Gouldia*) *modesta*, H. Adams, distinct from *Astarte excurrens*, Sc. Wood, against the suggestion of Gw. Jeffreys. Sc. Wood, Ann. N. H. (4) vi. p. 423. Jeffreys admits the distinctness, and thinks that *Gouldia* is merely a synonym of *Crassatella*, *ibid.* pp. 458, 459.

Crassatella subquadrata and *crebrilirata*, spp. nn., Agulhas Bank, and *foveolata*, sp. n., China seas. Sowerby, P. Z. S. 1870, p. 249.

Cardita cuvieri, Brod. 1832, = *melchlini*, Val. 1846, and *C. crassa*, Gray, described by Verrill, Am. J. Sc. xix. p. 225, La Paz, California.

UNIONIDÆ.

The fourth edition of I. LEA's synopsis of the Unionidæ contains, after a previous discussion on the best systematic arrangement of the genera and species, a list of all known species, with full synonymy and numerous annotations; further, a table of geographical distribution, an index of all the names of species, with statement where they have been published, and an extended list of books and papers referring to the subject. The author admits 1069 known species, and gives besides a list of 224 doubtful ones.

Dr. F. C. NOLL, who has made the curious observation that within living specimens of *Unio* and *Anodonta* the eggs of a Cyprinoid fish, *Rhodeus amarus*, are deposited and the young fishes developed (Zool. Gart. 1869, pp. 257-265, pl. 1; see Zool. Rec. vi. p. 136), adds several particulars concerning the development of the eggs of the mollusk itself, and some other animals infesting it (as *Alcyonella*). Zool. Gart. 1870, pp. 169-172. Dr. SCHOTT confirms these, *ibid.* pp. 237, 238. He also describes the life and development, the parasites and other enemies &c. of Unionidæ in a popular manner in Ber. senckenb. nat. Gesellsch. 1869-70, pp. 34-64.

Unio (Retz). An account of Lor. Spengler's monograph (1792) is given by Mörch, Mal. Bl. xvii. pp. 107, 108.

Unio tumidus var. *heckingi*, n., *batavus* var. *incurvatus* and var. *belgicus*, nn., Colbeau, Ann. mal. Belg. iii. (1868) p. 106, pl. 4. figs. 1-3, Belgium.

Unio mülleri, Rossm., probably only a variety of *U. tumidus*, Retz, again observed near Kiel by E. Friedel, Mal. Bl. xvii. pp. 46, 47.

Unio requienii, Mich., = *glaucinus*, Ziegl., *elongatulus*, Megerle, and *pictorum* (L.), Rossm., in the lake of Garda, where exists also a smaller variety of *Unio* or *Margaritana bonellii* (Fér.); *U. gurkanensis*, Ziegl., and *ovalis* (Megerle) enumerated as distinct species, but may be regarded also as varieties, the first of *requienii*, the latter of *pictorum*, or perhaps also of *requienii*. Betta, Moll. prov. Veron. pp. 140-145.

Unio præchistus, sp. n., Bourguignat, Ann. Mal. p. 37, mouths of the Danube.

Moncondylea (*Plagiodon*) *semisulcata*, sp. n., H. Adams, P. Z. S. 1870, p. 376, pl. 27. fig. 3, Eastern Peru.

Margaritana margaritifera (L.), in the streamlets of the Voigtland, is the subject of a paper written by C. F. Semmler, Mittheil. voigtl. Ver. Naturk. ii. 1870, p. 19.—*M. arcuata* (Barnes) defended as specifically distinct from the European *margaritifera*, L., by Gould, Invert. Mass. p. 176.

Alasmodonta penchinati and *berlani*, spp. nn., Bourguignat, Ann. Mal. p. 37, mouths of the Danube.

Anodonta. The embryonal shell is not lost but still to be seen in younger specimens, the umbones of which are not yet decorticated. Kobelt, Nachr. mal. Ges. ii. p. 149, and Zool. Gart. 1870, p. 172.

Anodon. Sowerby concludes, in Reeve's Conchologia Iconica, the monograph of this genus, with pls. 25–37. figs. 96–154. The apparently new species are:—*A. glabrus* [—er or *Anodonta glabra*], Val.?, pl. 25. fig. 97, locality unknown; *tricostatus*, pl. 25. fig. 98, China; *rio-platensis*, pl. 26. fig. 101, Rio Plata; *pholadiiformis*, pl. 27. fig. 106, Montreal; *subgibbosus*, Anthony, MS., pl. 27. fig. 107, Michigan; *quadruplicatus*, pl. 28. fig. 40, Potomac; *ciconia*, Gould, MS., United States, pl. 29. fig. 115; *vignonianus*, Bernardi, MS., pl. 29. fig. 116, Gaboon; *cumingii*, Lea, MS., pl. 30. fig. 122, Malacca; *brevis*, pl. 30. fig. 124, Rio Plata; *cochlearis*, pl. 33. fig. 135, locality unknown; *schomburgianus* [gk], pl. 34. fig. 137, British Guiana.

Anodonta kickæi, sp. n., with var. *interrogationis* [!], and *A. fallax*, sp. n., Colbeau, Ann. mal. Belg. iii. (1868) p. 107, pl. 3. figs. 1–3, Belgium. [The first may be safely united with *piscinalis*, Nilss.]

Anodonta benacensis, Villa, and *A. leprosa*, Parr., maintained as distinct species peculiar to Lake Garda. Betta, Moll. prov. Veron. pp. 136, 137.

MYTILIDÆ.

Mytilus edulis, L., very common in the estuaries of East Friesland, spawning in the months of April and May. The young are found living and growing on spots which are covered by water for only three or four hours in the day. This species is not much esteemed as food by the inhabitants. Metzger, J.B. Ges. Hannov. p. 29.

The breeding of *Mytilus edulis*, L., has been attended to in Northern Germany in the first half of the year 1870. The circular of the "Deutscher Fischerei-Verein," no. 3, pp. 10–18, and especially the pamphlet which Prof. K. Möbius has been induced by that Society to publish, contain useful information on this subject. The latter comes to the conclusion that the breeding of the mussel may be much improved in the Baltic and in the North or German Sea by floating hurdles on which the young mussels may fix themselves. The same subject is treated by F. C. NOLL, with general remarks on the consumption, and special reference to Möbius's paper, Zool. Gart. 1870, pp. 285–290. Some particulars concerning the actual culture of this mollusk in Kiel by Möbius, Zool. Gart. 1870, p. 126.

In North America *Mytilus edulis* is not used as food by man. Gould, Invert. Mass. p. 185.

Mytilus balki, Brusina, = *denticulatus* (Renier)! Brusina, Chier. Conch. p. 107.

Mytilus pharaonis, sp. n., Fischer, J. de Conch. xviii. p. 178, Red Sea, allied to *M. bidens* (L.) and *domingensis* (Lam.).

Crenella (*Modiolaria*) *viridula*, *compta*, and *gibba*, spp. nn., H. Adams, P. Z. S. 1870, p. 792; the second, pl. 48. fig. 17.

Dacrydium, Torell, reunited with the genus *Mytilus* by Jeffreys, Ann. N. H. (4) vi. p. 68.

Dacrydium, sp. probably new, near to the arctic *vitreum* (Möller), found in great depth of the Mediterranean near Palermo: the last-named occurs in pliocene beds of Italy, and is identical with *Modiola pygmaea*, Philippi, 1844. Allery de Monte Rosato, Bull. mal. Ital. iii. pp. 43, 44.

Lithodomus lithophagus (L.), its burrowing observed by C. Caramagna. The mollusk makes its appearance at regular intervals at the orifice of its hollow, and then lets itself drop with an audible noise to the bottom. In the fore part of many specimens there can be traced spots which have been injured and have been repaired by the animal—which tends also to prove the mechanical action of the burrowing. In a mole built only seven years ago specimens of a length of 13 millimetres and 11 in circumference have been found. Bull. mal. Ital. iii. pp. 46-49.

DREISSENIDÆ.

Dreissena polymorpha, var. *dilatata* and var. *angusta*, n., Colbeau, Ann. mal. Belg. iii. (1868) p. 108, pl. 4. figs. 5, 6, Belgium.

Tichogonia chemnitzii [*Dreissena polymorpha*] has made its appearance in the upper part of the Danube at Regensburg. Clessin, Nachr. mal. Ges. ii. p. 6.

Dreissena swinhoei, sp. n., H. Adams, P. Z. S. 1870, p. 379, pl. 27. f. 13, Yangtsekiang at Kweifoo.

AVICULIDÆ.

Perna fulgida, sp. n., H. Adams, P. Z. S. 1870, p. 7, pl. 1. fig 8, Red Sea.

OSTREACEA.

ARCIDÆ.

Arca scabra, Poli, different from *nodulosa*, Müll., identical with *pulchella*, Reeve. Weinkauff, Bull. mal. Ital. iii. p. 23.

Azinea (*Pectunculus*) *arabica*, sp. n., already figured in Savigny's Descrip. de l'Egypt, Moll. pl. 10. f. 4, H. Adams, P. Z. S. 1870, p. 792.

Lamopsis concinna, sp. n., H. Adams, l. c. p. 7, pl. 1. f. 10, Canary Islands.

NUCULIDÆ.

Nucula, *Yoldia*, and *Læda* [*Leda*]. Sowerby's monograph of these genera in the continuation of Reeve's Conchol. Icon., parts 284-287, illustrates 39 species (on 5 plates) of the first, 10 species (on 2 plates) of the second, and 9 species (on 2 plates) of the third.

Solonella inconspicua, sp. n., H. Adams, P. Z. S. 1870, p. 793, Red Sea.

Leda pusilla, sp. n. (Chiereghini), Brusina, Chieregh. Conch. p. 93, Adriatic.

Leda acuminata, sp. n., Jeffreys, Ann. N. H. (4) vi. p. 69, Mediterranean and West Coast of Ireland.

Leda irradiata, sp. n., Sowerby, P. Z. S. 1870, p. 250, China seas.

Leda dissimilis, sp. n., Sowerby in Reeve's Conch. Icon. pl. 2. f. 9, locality unknown.

Yoldia nana, sp. n., Sars, Bidr. Christ. Faun. p. 98, Christiana-fjord, Hardanger-fjord and Lofoten. Jeffreys thinks it to be identical with *Leda frigida*, Torell, which, however, is distinct from *Leda lucida*. Ann. N. H. (4) v. p. 440.

Yoldia obtusa, sp. n., Sowerby in Reeve's Conch. Ic. pl. 2. f. 10, locality unknown.

Solenella, three species figured by Sowerby in Reeve's Conch. Icon. part 284, 285, 1 pl.

Solenella subæqualis, sp. n., Sowerby, P. Z. S. 1870, p. 250, pl. 21. fig. 5, Rio Janeiro.

TRIGONIIDÆ.

Vorticordia and *Hippagus*. See *Anatinidæ*.

PECTINIDÆ.

Pecten abyssorum, Lovén, shell and living animal described by Sars, Bidr. Christ. Faun. p. 99, Christiana-fjord, 20–230 fathoms; Hardanger-fjord, to 450 fathoms; Manger, near Bergen, 40–50 fathoms; Lofoten Islands, 80–300 fathoms.—*P. aratus* (Gmelin) = *sulcatus*, Müll., Lovén, not Lam., two varieties, one of which very similar to *islandicus* (L.). Sars, ibid. p. 100.

Pecten quadriliratus, sp. n., Lischke, Mal. Bl. xvii. p. 29, Nangasaki.

Limæa pectinata, sp. n., H. Adams, P. Z. S. 1870, p. 7, pl. 1. fig. 11, Red Sea.

Radula tenuis and *R. (Limatula) pusilla*, spp. nn., H. Adams, l. c. p. 793, pl. 48. f. 18, 19, Red Sea.

OSTREIDÆ.

Ostrea [*Ostrea*]. Sowerby begins the monograph of this genus, in the continuation of Reeve's Conchologia Iconica, parts 284–287, with 16 plates and 35 figures. Apparently new among them are:—*O. belcheri*, pl. 7. f. 11, Eastern Seas?; *lurida*, Carpenter?, pl. 9. f. 15, Mazatlan; *permollis*, pl. 10. fig. 18, hab. —?; *ochracea*, pl. 10. f. 19, Mazatlan; *angassi*, pl. 13. f. 27, Port Jackson; *solida*, pl. 14. f. 28, Gulf of Panama; *radix*, pl. 15. f. 30, hab. —?; *chiloensis*, pl. 15. f. 33, Chiloe [= *chilensis*, Philippi]; *mexicani*, pl. 16. f. 35, Tehuantepec.

Ostrea edulis (L.) occurs on the coast of East Friesland only off the islands, in depths of 16–18 fathoms sporadically, and in those of 20–25 fathoms gregariously; they almost all bear specimens of *Balanus porcatus* (Da Costa) and *Verruca stræmia* (Müll.) on their shells. Within the estuaries the strong tidal movement of the water seems to hinder their spontaneous growth. The oyster-banks which occur there are probably caused by artificial importation, although mentioned as long

ago as 1730 and even 1650. The oysters from these estuaries exhibit only *Balanus crenatus* (Brug.), instead of the two other Cirripeds mentioned above. Metzger, J.B. Ges. Hannov. 1869-70, pp. 28, 29.

The breeding of oysters is the subject of an interesting pamphlet written by Prof. KARL MÖBIUS. He has visited the French and English establishments for this purpose, and comes to the conclusion that those in France, although great expense has been gone to, do not at all answer to the sanguine hopes which have been entertained. Concerning the English establishments, he thinks that they are still too new to admit of conclusive judgment. He then describes the natural oyster-banks on the western shores of Slesvick, and discusses in what manner they may be improved by keeping them clean from mud and destructive animals. The pernicious influence of long frost is observed (these observations will be found also in Zool. Gart. 1870, pp. 133, 134); and the hope that they may be artificially bred with success in the Baltic, where they do not live spontaneously, is contradicted by referring to several trials, all made without success. Several little maps are added in order to illustrate the geographical situation of the oyster-banks spoken of in Southern and Western France, in England, and in Slesvic.

Another official report by A. TOLLE concerning a journey to visit the oyster-breeding establishments in England and France, bearing the date 1871, but really published in December 1870, treats chiefly of the statistics, topography, and instruments of these establishments on the various shores of France and those near the mouth of the Thames.

Ostrea edulis (L.) and *O. hippopus* (Lam.) both occur on the western shores of Schleswig since immemorial, and are used as food by man; intermediate forms do not occur, but certainly "approximative" ones. Friedel, Mal. Bl. xvii. pp. 79, 80. [This modifies a former statement, Zool. Rec. iv. p. 592.]

The Belgian oyster-banks are the subject of a short communication by Lanszweert, Ann. mal. Belg. pp. xvii, xviii.

COLBEAU has observed that oysters remained alive, when taken from the water, for fourteen days, March 23 to April 5. Ann. mal. Belg. iii. (1868) p. xx.

Ostrea pauluccia (Crosse) figured, J. de Conch. xviii. pl. 2. fig. 3, China.

MOLLUSCOIDA

BY

EDUARD VON MARTENS, M.D., C.M.Z.S.

LIST OF PUBLICATIONS.

- DALL, W. H. A revision of the Terebratulidæ and Lingulidæ. Am. J. Conch. vi. pp. 87-168, with pls. 6-8 and numerous woodcuts.
- DÖNITZ, W. Ueber die sogenannte Chorda der Ascidienlarven und die vermeintliche Verwandtschaft von wirbellosen und Wirbelthieren. Arch. Anat. u. Phys. 1870, pp. 761-764. A previous notice of the same in SB. nat. Fr. 1870, pp. 47-51.
- GANIN, M. Neue Thatsachen aus der Entwicklungsgeschichte der Ascidien. Z. wiss. Zool. xx. part 4, pp. 512-518.
- GOULD, AUG. Report on the Invertebrata of Massachusetts. Second edition. By W. G. BINNEY. Boston: 1870, 8vo. The drawings of the Tunicata are due to Prof. Agassiz and his son.
- HANCOCK, ALB. On the larval state of *Molgula*, with descriptions of several new species of Simple Ascidians. Ann. N. H. (4) vi. pp. 353-367.
Read at the Meeting of the British Association held at Liverpool, 1870.
- KENT, W. S. On a new Polyzoon, *Victoriella pavid*, from the Victoria Docks. J. Micr. Soc. (2) No. xxxvii. January 1870, pp. 35-39, pl. 4.
- KUPFFER, C. Die Stammverwandtschaft zwischen Ascidien und Wirbelthieren. Arch. mikr. Anat. vi. Also published as a separate volume of 58 pages, in 8vo, with 3 plates.
- LACAZE-DUTHIERS, —. Recherches sur l'organisation et l'embryogénie des Ascidies; évolution de la *Molgula tubulosa*. C. R. lxx. 1870, May, pp. 1154-1157, and R. Z. 1870, pp. 206-209. Translated in Ann. N. H. (4) vi. pp. 109, 111.

- LANSZWEERT**, —. Liste de zoophytes et de mollusques inférieurs (tuniciers et bryozoaires) du littoral Belge. Ann. mal. Belg. iii. (1868) pp. 113–126.
- METZGER**, A. Die wirbellosen Meeresthiere der ostfriesischen Küste. JB. Ges. Hann. 1869–1870 (publ. 1871), pp. 22–36, 4to.
- MORSE**, EDW. S. The Brachiopoda, a division of Annelids. P. Bost. Soc. June 1, 1870. A full abstract in Am. J. Sc. 1. pp. 100–104, and Ann. N. H. (4) vi. pp. 267–270.
- NOLL**, F. C. Flussaquarien. Zool. Gart. 1870, pp. 165–173, 269–275.
- PERKINS**, GEO. H. Molluscan Fauna of Newhaven. Part II. (Acephala and) Bryozoa. T. Bost. Soc. xii. p. 139.
- REICHERT**, K. B. Vergleichende anatomische Untersuchungen über *Zoobotryon pellucidus* (Ehrenb.). Abh. Ak. Berl. (read 1869, publ. 1870), pp. 233–338, 4to, with 6 plates.
- SARS**, MICH. Bidrag til Kundskab om Christiania-fjordens Fauna. Part II. Christiania: 1870, 8vo.
- SEGUENZA**, G. Dei Brachiopodi viventi e terziarii pubblicati dal Prof. O. G. Costa. Bull. mal. Ital. iii. pp. 145–160.
Chiefly palæontological.

CONTRIBUTIONS TO FAUNAS.

Norway. Six species of simple Ascidizæ, among which *Pelonaia corrugata*, Forbes, and 21 species of Polyzoa, found in the fjord of Christiania, are enumerated by M. Sars, Bidr. Christ. Faun. pp. 102–106.

German Sea. One species of Ascidia, *Phallusia intestinalis* (L.), and 17 of Bryozoa, but no Brachiopoda, are enumerated as found hitherto on the coasts of East Friesland, by A. Metzger, *l. c.* pp. 30, 31.

Belgium. Five species of Tunicata, 5 freshwater and 26 marine Bryozoa, found on the shores and in the waters of Belgium, are enumerated by Lanszweert, Ann. mal. Belg. iii. (1868) pp. 113–118.

Mediterranean. Twelve recent species of Brachiopods described and figured in Costa's 'Fauna del Regno di Napoli,' are reviewed and determined by G. Seguenza, Bull. mal. Ital. iii. pp. 146–149.

North America. Three species of Brachiopods and 28 of Tunicata are enumerated by W. C. Dall in his revision of the Mollusca of Massachusetts, P. Bost. Soc. xiii. pp. 254, 255.—The Bryozoa of New Haven are treated by Perkins, P. Bost. Soc. xii. p. 139.

BRACHIOPODA.

E. S. MORSE, who has studied the early stages of *Discina* and living specimens of *Lingula*, calls the attention of naturalists to

the points of resemblance between the Brachiopoda and the Articulata, principally the Annelides. The caecal prolongations of the mantle in *Terebratulina*, the polygonal cells in the shell of the young *Discina*, find analogies among the Crustacea. The substance of the shell of *Discina* appears by chemical experiments to be chitinous. The setæ or bristles of the Brachiopods are secreted by follicles and surrounded by muscular fibres, like those of the Annelides, and are also of identical structure with them. In the early stages of *Discina* these bristles are large and are moved freely by the animal, as in many worms and some young Polyzoa. The lophophore of the Brachiopods is compared to the arm-like supports of the gills in some tubicolous Annelids, as *Sabella*, and the mantle to the cephalic collar. The soft folds or lamellæ of the internal surface of the mantle, the existence of which is proved by Morse, are compared to similar features in the Balanidæ. The blood of *Lingula* is red as in some Annelides. The peculiar oviducts, with their trumpet-shaped openings, are quite unlike those of any mollusk, but bear close resemblance to those of many worms. He comes to the conclusion that the Brachiopoda should be removed from the Mollusca and placed within the Articulata among the Annelides, forming a highly cephalized division of that class. P. Bost. Soc. June 1, 1870; abstracts in Am. J. Sc. i. pp. 100-104, and Ann. N. H. (4) pp. 267-270.

DALL, W. H., publishing a revision of the genera and subgenera of the Terebratulidæ and Lingulidæ, Am. Journ. Conch. vi. pp. 87-168, opposes this removal, pp. 87-95.

Terebratulina septentrionalis (Couthouy) kept distinct from the European *caput-serpentis* (L.). Gould, Invert. Mass. 2nd edit. p. 208.

Terebratella caurina, Gould, from Puget Sound, Dall, l. c. p. 139, pl. 6. figs. 1-3.—*T.*, sp. (an *suffusa*, Reeve?), ibid. p. 122, pl. 8. fig. 4.

Laqueus, new subgenus of *Terebratella*. The reflected portion of the loop attached by slender processes on each side to the hamal processes at or near the points where the two septal processes branch off to the septum. Foramen complete. *L. californicus*, Koch, Dall, l. c. p. 123, pl. 8. figs. 9, 10; and *L. suffusus*, sp. n.?, l. c. p. 123, pl. 7. fig. 9h.

Terebratella, subgenus *Ismenia*, King; *I. sanguinea* (Chemn.), Dall, l. c. p. 127, pl. 8. fig. 13.

Magas patagonica, Gould, Dall, ibid. p. 133, pl. 6. figs. 11, 12, from Orange Harbour, Patagonia.

Magasella, new subgenus of *Magas*. The reflected portions of the apophyses united, forming a loop. *Magasella flexuosa* (King) = *magellanica* (Reeve); *M. laevis*, sp. n. ? = *malvinæ* (Orb.)?, both from Orange Harbour, Patagonia; *M. spitzbergensis* (Davids.), *cumingi* (Davids.), and *crenulata* (Sow.), Dall, l. c. pp. 135-138; *laevis* figured, pl. 6. figs. 9, 10, and 13.

Megerlia. *Platydia davidsoni*, Deslongchamps, belongs to the genus *Megerlia*, and is probably an abnormal form of *M. truncata*. Jeffreys, Ann. N. H. (4) vi. p. 457.

Terebratula monstrosa, Scacchi, is distinct from *M. truncata*, L.; and *T. lunifera*, Philippi, is a variety of *monstrosa*. Seguenza, Bull. mal. Ital. iii. pp. 147, 148.

Argiope. *Orthis bifida*, Costa, is a variety of *A. neapolitana*. Seguenza, l. c. p. 147.

Lingula pyramidata, Stimps., studied on the shores of North Carolina by E. S. Morse. It is found in a sand-shoal at low-water mark, buried just below the surface of the sand. The peduncle is encased in a sand-tube, differing in no respect from the sand-tube of neighbouring Annelides, and has been found broken and repaired in many cases. The animal has the power of moving over the sand by the sliding motion of the two valves, using at the same time the fringes of the setæ, which swung promptly back and forth like a galley of oars. P. Bost. Soc. June 1, 1870 (Am. J. Sc. 1. pp. 100-104).

TUNICATA.

ASCIDIÆ SIMPLICES.

C. KUPFFER has observed the development of *Ascidia canina*, Müll., which is common on the *Zostera marina* at Kiel.

Before his researches he was rather sceptical concerning the homology of the larval organs in the Ascidiidæ with those of the Vertebrata, but now comes to the conclusion that this homology exists, and certainly in a higher degree in the *Ascidia canina*, observed by himself, than in *A. mamillata*, observed by Kowalewsky, and that this homology is shown as well by the genesis as by the relative position of the organs. The most striking examples are, according to him:—1. The chorda originating from a double row of internal cells, and transforming itself into a hyaline, cartilaginous, elastic axis, with an envelope of cellular structure. 2. The position of the central nervous system above, and that of the intestinal tube below this chorda. 3. The genesis and form of the nervous system itself. 4. The intimate connexion of the branchial sac and the intestinal tube, both making their first appearance as one common organ. 5. The relations of the muscles to the envelope of the chorda. Some peculiarities, on the contrary, of the Ascidiæ, in their development, disagreeing with that of the Vertebrata, are the retardation and very low degree of the circulatory system and the conjunctive or mucous membranes—and, further, the very strange gelatinous envelope of the whole larva, containing amœboid cells, and originating from the peripheric cellular stratum of the yolk existing before the fecundation.

The author proceeds to trace the metamorphosis from the larva to the full-grown *Ascidia*. He states, among other particulars, that the endostyle of the *Ascidia* is formed by the original epithelium of the branchial sac in a ventral furrow of the larva, and adopts, therefore, also the determination of

dorsal and ventral side of these animals, in the same manner as the late Keferstein.

A short abstract of Kowalewsky's and Kupffer's researches concerning the embryology of Ascidiae is to be found in Journ. Micr. Sc. 1870, pp. 59-69 and 299.

Dr. W. DÖNITZ opposes these views. He states, from observations on *Clavellina lepadiformis* (Müll.), made by him at Naples, that the cleaving of the yolk and the formation of a yolk-membrane is here as usual, that the intestine is not formed by any invagination, that the central nervous system, as described by Kowalewsky, is not found in the larvæ of *Clavellina*, and concludes that the string of cells, intermixed with vacuoles, in the axis of the tail of those larvæ is only apparently similar to the chorda of a vertebrate, but really quite different,—these cells being arranged concentrically, and not in bilateral order, and nothing like a vertebra being associated with them; he thinks it even very doubtful if the adjoining cells can be regarded as muscular cells. SB. nat. Fr. 1870, pp. 47-51; also in Arch. Anat. u. Phys. pp. 161-164.

M. GANIN, from his observations on the development of the compound Ascidiae (see below), comes to the conclusion that the nervous system of the embryo is, in its development, in its form, in its structure, and in its local relations to the other organs, more similar to the nervous system of the embryo of the Vertebrata than to that of any other embryo or full-grown animal. The ciliated pit in the Ascidiae is to be compared to the nasal organ of *Amphioxus*. He coincides, therefore, with Kowalewsky [and Kupffer] as to the affinity of the Ascidiae in their embryonic stage with the Vertebrata, and refutes the objections made by Mecznirow (Zool. Rec. vi. p. 594). Z. wiss. Zool. xx. pp. 513, 517.

LACAZE-DUTHIERS, studying the development of various genera of Ascidians by means of artificial fecundation, observed the very strange fact that the embryo of what he believes to be *Molgula tubulosa* is widely different from that of others, being an unformed mass, with slow amœboid motion. C. R. June 1870, and R. Z. 1870, pp. 206-209; translated Ann. N. H. (4) vi. pp. 109-111.

A. HANCOCK points out that a tadpole-like larva, like that of other Ascidiae, has also been observed by Van Beneden in a real *Molgula, ampulloidea* (Beneden), and by himself in *M. complanata*, sp. n.; and he suggests that the animal observed by Lacaze-Duthiers was not a true *Molgula*, but *Eugyra arenosa*, Ald. and Hanc. His observation, however, is not the less interesting on that account. Ann. N. H. (4) vi. pp. 353-355.

Ascidia plana, alderi, rubrotincta, rubicunda, robusta, mollis, crassa, inornata,

producta, *elongata*, *affinis*, and *normani*, spp. nn., Hancock, *l. c.* pp. 355-361, all British.

Ascidia amphora, *psammophora*, *ocellata*, *carnea*, Agassiz, and *callosa*, Stimps., described and figured in the new edition of Gould's *Invert. Mass.* pp. 23-26, pl. 24. figs. 330-335, and pl. 23. fig. 318, Massachusetts.

Corella, gen. nov. Apertures as in *Ascidia*; test smooth and diaphanous; viscera sinistral; intestine bending backwards and downwards on the left side, passing along the base of the mantle, and rising in front to the anal aperture; branchial sac with the secondary vessels regularly and beautifully convoluted. Type *Ascidia parallelogramma*, Müll. New British species: *C. larvæformis* and *ovata*. Hancock, *l. c.* pp. 362, 363.

Ciona, Sav., Flem., fully characterized (type *Asc. intestinalis*, Müll.), and *C. fascicularis*, sp. n., described, by Hancock, *l. c.* p. 364, Great Britain.

Cynthia scabriuscula, sp. n., Sars, *Bidr. Christ. Faun.* p. 102, Dröbak, near Christiania, 100-120 fathoms.

Cynthia pyriformis (Rathke), *echinata* (L.), *placenta* (Packard), *condylomata* (Packard), and *hirsuta* (Agassiz) described and figured by Gould, *l. c.* pp. 17-20, pl. 23. figs. 320, 321, 326, 322, 324, and 336, Massachusetts.

Glandula mollis and *fibrosa*, Stimps., Gould, *l. c.* p. 23, pl. 22. fig. 317, pl. 23. fig. 323, and pl. 24. figs. 328, 329.

Molgula simplex, *inconspicua*, and *complanata*, spp. nn., Alder (MS.) and Hancock, *l. c.* pp. 365-367, British.

Molgula producta, Stimpson, Gould, *Invert. Mass.* 2nd edit. p. 21, pl. 22. figs. 315, 316, Massachusetts.

Eugyra, gen. nov., Alder (MS.) and Hancock. Body globular, unattached, covered with glandular fibrils, and a coating, more or less complete, of fine sand. Branchial aperture 6-lobed, anal 4-lobed; branchial sac without folds, but with longitudinal plates or bands; the meshes regularly convoluted and produced into little cones, each being composed of a double spiral coil of vessels, which spirals, turning in opposite directions, meet at the apex. Type *Molgula arenosa*, Alder and Hancock, = *M. tubulosa* of Forbes and Hanley's 'Brit. Moll.'—*E. globosa*, sp. n., Guernsey. Hancock, *l. c.* p. 367.

Boltenia clavata (Fabr.), *rubra*, Stimps., *microcosmus*, Agassiz, and *burkhardtii*, spp. nn., Agassiz, MS., described and figured by Gould, *l. c.* pp. 14-16, pl. 23. fig. 325, pl. 24. figs. 337, 338, and 327, Massachusetts.

ASCIDIÆ COMPOSITÆ.

M. GANIN publishes a preliminary report on his observations concerning the development of the compound Ascidiæ, especially *Didemnum gelatinosum*, Sav., and four species of *Botryllus*. The egg of *Didemnum* produces one embryo and one larva, but this larva two individuals of the developed animal, as on the surface of the integument of the larva four gems arise, which unite themselves afterwards into two individuals. Each individual is formed by two gems of different shape and signification. The one, pedunculated, produces the branchial sac, the endostyle, the ciliated furrow, the ciliated arch, the nervous and muscular systems, and is called "thoracic gem" (*Brustknospe*) by the author. The other, sessile, produces the greater part of the intestinal

tract, the sexual organs, and the vascular system, and is called "abdominal gem" (*Bauchknospe*). From the peduncle of the first come the œsophagus and the rectum. In *Botryllus* also the egg produces only one embryo and one individual. The supposed eight embryos in the egg are the first elements of the stolons, which augment afterwards in number, and persist in the compound colony. The other individuals of *Botryllus* arise from gems produced by the first. This first individual is always without sexual organs, and produces, therefore, no eggs; the following individuals, produced by gemmation, produce eggs. There are no preexisting orifices for the issue of the eggs; but these force their way through the integument of the mother, taking a part of it with them as a temporary envelope.

The first appearance and development of the medullary tube, the intestinal tract, the branchial sac and its fissures are the same in the compound and in the simple Ascidians; but several of Kowalewsky's observations concerning this development of the embryo are erroneous. Z. wiss. Zool. xx. pp. 512-518.

Botryllus schlosseri (Pall.), Gould, Invert. Mass. p. 3, pl. 23. fig. 319, Massachusetts.

POLYZOA.

K. B. REICHERT thinks that in the Bryozoa neither true muscles nor true nerves exist, the histological structure of the organs hitherto regarded as such being different from that of the muscles and nerves of the higher animals; consequently he proposes to remove the Bryozoa from the Molluscoidea, and to place them near the Anthozoa and Medusæ in a large division of lower invertebrate animals, which corresponds otherwise to Leuckart's *Cœlenterata*. He regards the Bryozoa generally as subject to alternating generation—the so-called cell being a distinct previous individual, to be compared with the "nutrix" of the other cases of alternating generation, the "collare setosum" (operculum) and "collare stellatum" belonging to the same, and the intestinal tractus, with the crown of tentacles, constituting a second individual, which takes its origin by gemmation from the first. He adopts for the first the name fostering capsule (*Brutkapsel*), for the second the name *bryozoid*. The whole organization of the Bryozoa is interpreted according to this view; and the invagination of the bryozoid within the cell by two sorts of retractores is the object of special research. Finally, the author distinguishes between those Bryozoa in which a distinct common stem exists, called bryozophylon, which bears the single animals on its sides, as in the Vesiculariadae, and those which are constituted only by the single animals budding one from the other, without a common stem, as in most other Bryozoa. He calls

the former "*Stammstücke*" (stem-compositions), the latter "*Zellen- oder Brutkapselstücke*" (cellular or capsular compositions). One instance only is known to him in which the capsules or cells arise first from a stem and afterwards from other cells; this is *Cellularia chelata* (Pall.) [*Scruparia*, Busk], observed by him at Spezzia. Reichert, Abh. Ak. Berl. 1869, pp. 233-323.

CTENOSTOMATA.

VESICULARIADÆ.

Zoobotryon pellucidum, Ehrenberg. This curious animal, which was, as lately as 1849, still inserted by algologists in the vegetable kingdom, under the name *Ascothamnion*, is fully described, and its relations to the Vesiculariadae made out, by K. B. Reichert, l. c. pp. 233-235, 240-251, 257-264, pls. 1-6.

Victoriella, gen. nov., Kent, J. Micr. Soc. 1870, pp. 35-39, pl. 4. Polypidom horny, tubular; cells not deciduous nor separately distinguishable, but throughout freely communicating, their terminations flexible and invertile; no gizzard; eight ciliated tentacles.—*V. pavidæ*, sp. n., Victoria Docks, in brackish water, on *Cordylophora*. The author proposes a new family, *Homodiatidæ*, for this genus, near to the *Vesiculariæ*.

PHYLACTOLÆMATA.

Alcyonella, two different species, and *Fredericella sultana* observed in the river Main near Frankfort, the first fixed on the shells of *Unio*, by F. C. Noll, Zool. Gart. 1870, pp. 171, 173.—*Cristatella mucedo*?, or perhaps *ophidioides*, Hyatt, in the Rhine at the "Lorley," and its locomotion described, by the same, l. c. p. 274.

CRUSTACEA

BY

EDUARD VON MARTENS, M.D., C.M.Z.S.

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- BÆCK, AXEL. Crustacea Amphipoda borealia et arctica. Overs. Dan. Selsk. 1870, pp. 83-280.
[Received too late for full notice this year.]
- BRADY, HENRY G. The Ostracoda and Foraminifera of Tidal Rivers. Part i. (*Ostracoda*). Ann. N. H. (4), vi. pp. 1-33.
- . Contributions to the Study of the Entomostraca.— V. Recent Ostracoda from the Gulf of St. Lawrence. Ibid. pp. 450-454, pl. 19.
- CHANTRAN. Observations sur l'histoire naturelle de l'Écrevisse. C. R. lxxi. pp. 42-45.
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- CLAPARÈDE, ED. Note sur les Crustacés Copépodes parasites des Annélides, et description du *Sabelliphilus sarsii*. Ann. Sc. Nat. (5) xiii. pp. 1-18.
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- CZERNIAVSKI, VOLDÉMAR. Materialia ad zoographiam Ponticam comparatam. [Transactions of the first meeting of Russian naturalists in St. Petersburg, 1868, 4to, pp. 19-136, 8 pls. (written in Russian).]
- DOHRN, ANT. Untersuchungen über Bau und Entwicklung der Arthropoden. VI. Zur Entwicklungsgeschichte der Panzerkrebse, *Decapoda loricata*. Z. wiss. Zool. xx. pp. 248-271, pl. 16.—VII. Zur Kenntniss vom Bau und der Entwicklung von *Tanais*. Jen. Z. Nat. v. pp. 293-306, pls. 11 & 12.—VIII. Die Ueberreste des Zoea-Stadiums in der ontogenetischen Entwicklung der verschiedenen Crus-

- taceen-Familien. Ibid. pp. 471-491.—IX. Eine neue Nauplius-form, *Archizoea gigas*. Z. wiss. Zool. xx. pp. 597-606, pls. 18 & 19.—X. Beiträge zur Kenntniss der Malakotraken-Larven. Ibid. pp. 607-626, pls. 30-32.
- DOHRN, ANT. Geschichte des Krebsstammes, nach embryologischen, anatomischen und paläontologischen Quellen. Jen. Z. Nat. vi. pp. 96-156.
- ERNST, A. Letter from Caracas. P. Z. S. 1870, pp. 2, 3.
- HARTMANN, ROB. Beiträge zur anatomischen Kenntniss der Schmarotzerkrebse. 1. Ueber *Bomolochus belones* (Burm.). 2. *Lernæocera barnimii*. Arch. Anat. Phys. 1870, pp. 116-158 and 726-752, with 4 plates.
- HESSE, M. Observations sur des Crustacés rares ou nouveaux des côtes de France. No. XVII. Description d'un nouveau Crustacé type d'une nouvelle famille des Annélidicoles, &c. Ann. Sc. Nat. (5) xi. 1869, pp. 275-286, pl. 1.
- . Description d'un nouveau genre de Crustacés habitant les Ascidies et de quelques espèces du même groupe. Ibid. pp. 287-308.
- JARSCHINSKI, F. [On the Leydigian organs at the antennæ of the Crustacea Amphipoda. Transactions of the first meeting of Russian naturalists at St. Petersburg, 1868, 4to, pp. 311-318 (written in Russian).]
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- MARTENS, ED. VON. Ueber einige australische Süsswasserkrebse. SB. nat. Fr. 1870, pp. 1, 2.
- METZGER, A. Die wirbellosen Thiere der ostfriesischen Küste. JB. Ges. Hannov. No. xx. for 1869-70, pp. 22-27 [generalities] and 31-33 [Crustacea].
- MILNE-EDWARDS, ALPH. Note sur le *Catoptrus*, n. g. appartenant à la division des Crustacés brachyures catométopes. Ann. Sc. Nat. (5) xiii. 1870 (not paged).
- MÜLLER, FRITZ. Bruchstücke zur Naturgeschichte der Bopyriden. Jen. Z. Nat. vi. pp. 53-73, pls. 3 & 4.
- PLATEAU, F. Recherches sur les Crustacés d'eau douce de la Belgique. Parts II. & III. Mém. Ac. Belg. sav. étr. vol. xxxv. An abstract in Ann. N. H. (4) v. pp. 367-372.

- RICHIARDI, S. *Bomolochus ostracionis*. Arch. p. Zool. ii. pp. 47-59, pl. 1.
- SARS, MICH. Bidrag til Kundskab om Christianiafjordens Fauna. II. Crustacea. Christiania: 1870, 8vo, 48 pp. 3 pls.
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- STREETS, T. HALE. Notes of some Crustacea of the genus *Libinia*, with descriptions of four new species. P. Ac. Philad. 1870, No. 3, pp. 104-107.
- VERRILL, A. E. Observations on Phyllopod Crustacea of the family *Branchipidae*. P. Am. Ass. 1869 [published July 1870]. 18 pp.
- WAGNER, NICOL. [*Hyalosoma dux*, a new form of Amphipod Crustacea. Transactions of the first meeting of Russian naturalists at St. Petersburg, 1868, pp. 218-238, 4 pls.]
- WRIGHT, EDW. PERCEVAL. On a new species of the genus *Pennella*. Ann. N. H. (4), vol. v. p. 43, pl. 1.

MORPHOLOGY.

A. DOHRN publishes two papers concerning the common points in the embryonic development and the probable common origin of the different orders of the Crustacea. In the first he points out not only that the Decapoda pass during their development from the stage of *Nauplius* to that of *Zoea* (the suppression of these stages, as in *Astacus fluviatilis*, being an exception), but also that in the other orders of Crustaceans there are traces which suggest the conclusion that they have had in former times such a *Zoea*-stage; he regards the dorsal spine as a very essential character of *Zoea*, and thinks that the dorsal accumulations of cells in the embryos of some Isopods and Amphipods, the so-called micropyle-apparatus in the Amphipods, the dorsal sucker of the larvæ of *Limnadia* and the Cladocera, the frontal fixing apparatus of *Caligus* and *Chalimus*, and the peduncle of the Cirripeds are to be regarded as transformations of the dorsal spine of *Zoea*; several other hitherto enigmatical organs in the larvæ of various Crustacea are interpreted in the same way. Jen. Z. Nat. v. pp. 471-491.

In the second, very extended, paper he endeavours to trace the probable origin of all groups of the Crustacea from a *Nauplius*, which itself may have taken its origin from lowly organized members of the class Vermes. *Archizoea* is regarded as an intermediate stage between *Nauplius* and *Zoea*. The metamor-

phosis of the natatorial feet to the mandibles and maxillæ, and the formation of a dorsal shield, both lying between the stages of *Nauplius* and *Zoea*, are fully discussed. Then the author proceeds by acknowledging the existence of a gap between *Zoea* and the Phyllopods; but nevertheless he thinks probable that all the present orders of the Crustacea did originate from Phyllopoda. These separated themselves into two branches: some, remaining natatorial, and transferring the respiratory function from the dorsal shield to the natatorial feet, gave origin to all *Podophthalma* and *Edriophthalma* (the recent genus *Nebalia* is regarded as representing a link in the chain of this transformation); others, losing more or less their natatory propensities, and developing the dorsal shield into a strong mostly bivalve shield sufficient for protecting the whole body, which becomes shortened for this purpose, gave origin to the Ostracods, Cirripeds, and even to the Copepoda. The Trilobites belong also to this stage of historical development. The question whether the Ostracoda can be reduced to transformed Phyllopoda, which Prof. Claus is inclined to maintain and F. Müller to deny, is fully discussed, chiefly with regard to the organization of the genus *Cypridina*, and fully upheld. Jen. Z. Nat. vi. pp. 96-156.

In some specimens of *Astacus (Cheraps) preissii* (Erichs.), which have the internal and external male organs well developed, an analogue of the orifice of the female organs has also been observed in the chitinous tegument by the Recorder. SB. nat. Fr. 1870, p. 1.

CONTRIBUTIONS TO FAUNAS.

A. METZGER gives a list of Crustacea observed hitherto on the coast of East Friesland (between the mouths of the rivers Ems and Jahde), containing 24 species of Decapoda, 19 Amphipoda, including 2 Læmodipoda, 7 Isopoda, 5 free Copepoda, 10 parasitical Caligidæ and Lernæidæ, 8 Cirripeda (and 3 Pycnogonida). Their modes of occurrence are accurately stated. JB. Ges. Hannov. pp. 31-33.

The Gammaridæ (3 species), Lynceidæ (6), and Cypridæ (23) of the fresh waters of Belgium are given by F. Plateau, Mém. cour. Ac. Belg. xxxiv. 1869-70; the Daphniidæ and Cyclopidae in the following volume (xxxv.), 1870.

The Ostracoda of the tidal rivers of the eastern parts of England, especially the tidal lakes or "broads" of East Norfolk, have been examined by H. G. BRADY. Although the water of most of them is perfectly fresh, there have been found many new and highly interesting species and even genera, the most characteristic of which are *Goniocypris mitra*, *Metacypris cordata*, *Polycheles stevensoni*, and *Cythere fuscata*. Some of them have been found also in the Dutch rivers Meuse and Scheldt. The author is not inclined to ascribe the presence of these and

other rather marine forms to recent immigration from the sea upwards, but thinks that they have remained from the old times when this soil was part of the sea. The said species are all found by dredging, and not on the surface of the water. The localities are exactly described; and in the introductory remarks the principal Ostracoda of salt marshes and of estuaries are also named; in the latter marine and freshwater species are mixed. A list of 84 species found in the river-estuaries of England and Scotland, and another of 99 from the English Fen-district and Holland, terminate the paper. Ann. N. H. (4) vi. pp. 1-33.

Black Sea. The Crustacea are reviewed by CZERNIAVSKI in a somewhat long paper written in Russian; most of them are identical with Mediterranean species—as, for example, *Stenorhynchus longirostris*, *Pilumnus hirtellus*, *Eriphia spinifrons*, *Pachygrapsus marmoratus*, *Diogenes varians*, &c. The author has made his observations at Jalta, on the south-eastern coast of the Crimea: he enumerates 80 species, 71 of which have been observed in about 150 square fathoms on stones in a depth of under 5 feet, in the months of June and August (old style). Seven other species have been obtained with the surface-net of J. Müller; only two species, *Portunus holsatus* and *Callinassa subterranea*, have been observed in a greater depth than 5 feet. The author is inclined to think the Black Sea much richer in Crustacea than the Belgian shores, and even the British seas.

Another list of Crustaceans found in the Black Sea, containing 55 species, some of which are new, but not described, is given by F. Marcusen in the same journal, pp. 177, 178.

Twenty-nine species of Ostracoda found in various depths, from 10-250 fathoms, in the *Gulf of St. Lawrence* are enumerated by Brady, l. c. pp. 450-454; some new or remarkable species described and figured. He has also described in Berchon and Folin's 'Fonds de la Mer' others from the *West Indies*, p. 191; the *Cape-Verd Islands*, p. 192; *Pulo Pinang*, p. 194; the *Straits of Magellan*, pp. 198-202.

America. A few *Brazilian* Crustacea are mentioned in the very prolix description of the Imperial and National Museum at Rio Janeiro, published by L. Netto, pp. 305-307.

Forty species, most of them new, are described, eight from *Central America*, Peru, &c., by Sid. Smith, Tr. Conn. Acad. ii. pp. 113-174.

DECAPODA.

BRACHYURA.

OXYRHYNCHA.

Chionæetes chilensis, sp. n., Streets, P. Ac. Phil. 1870, p. 106, Chile.

Stenorhynchus longirostris, M.-Edw., found at St. John, in the Crimea, only females, and compared with *St. ægyptius*, Heller, by Czerniavski, l. c. p. 77.

Libinia dubia, M.-Edw., = *distincta*, Guérin, and *L. canaliculata*, Say, their

differences exposed; *L. affinis* stated to be the young state of the latter; *L. subspinosa*, sp. n., Chile, *rhomboidea*, sp. n., East Indies [P], and *inflata*, doubtful sp. n., West Indies, Streets, P. Ac. Phil. 1870, pp. 104-106.

Huemia bifurcata, sp. n., Streets, P. Ac. Phil. 1870, p. 107, New Zealand.

CYCLOMETOPA.

Plumnus hirtellus (Penn.), var. *pontica*, Czerniavski, l. c. p. 75.

Portunus holsaticus, Fabr., and *puber*, L. Some observations concerning its larva in the form of *Zoea*, A. Dohrn, Z. wiss. Zool. xx. 4, pp. 610-617, pl. 31. f. 12-14, and Jen. Z. Nat. v. p. 474.

CATOMETOPA.

Catoptrus, g. n. Cephalothorax arcuate as in the Cyclometopa, its edges with numerous indentations; basilar article of the outer antennæ small; endostome canaliculated; third article of the outer maxillipeds truncated at its anterior and internal angle. Efferent channels as in *Boscia*.—*C. nitidus*, sp. n., A. Milne-Edwards, Ann. S. Nat. (5) xiii. 1870, no. 2 (not paged), Samoa Islands.

Gelasimus. 21 American species are described, and 12 figured, divided into three groups (probably of generic value). None are common to the Atlantic and Pacific coasts (except *G. stenodactylus*, M.-Edw., Brazil and Chile). The new species described are:—*G. heterophthalmus* and *heteropleurus*, sp. nn., Fonseca, Centr. America; *G. princeps*, sp. n., Corinto, West Nicaragua; *G. armatus*, sp. n., Fonseca; *G. ornatus*, sp. n., Centr. America; *G. pugnax*, sp. n. (= *pugillator*, Lec.), Newhaven to the Bahamas; *G. rapax*, sp. n., Aspinwall; *G. mordax*, sp. n., Para; *G. gibbosus*, sp. n., Fonseca, S. F. Smith, Tr. Conn. Acad. ii. pp. 113-142, pl. ii. figs. 1-11, iii. figs. 1-5, iv. figs. 1-8.

Cardiosoma crassum, sp. n., Fonseca; *guanhumi*, Ltr.; *quadratum*, Sauss., described by Smith, l. c. pp. 142-144, pl. v. figs. 3-5.

Pseudothelphusa plana, sp. n., Peru. Eight other species are placed in this genus (= *Boscia*, M.-Edw. preocc.), Smith, l. c. pp. 146-148.

Opisthocera, gen. nov. In the character of the front it agrees with *Pseudothelphusa*, but in the position of the antennæ with *Epilobocera*. *O. gilmanii*, sp. n., Smith, l. c. p. 149, pl. v. fig. 1, Isle of Pines [America].

Epilobocera armata, sp. n., Bahamas?, *E. cubensis*, Stimps. Smith, l. c. pp. 150-152, pl. v. fig. 2.

Glyptograpsus, gen. nov. The form of the carapace and number of lateral teeth recall *Cryptograpsus*; but in the form of the maxillipeds it is allied to *Heterograpsus*. The form of the epistome and the peculiar deep efferent orifice furnish very distinctive characters.—*G. impressus*, sp. n., Acajutla, Centr. America, Smith, l. c. p. 155.

Sesarma sulcata, sp. n., Corinto, Nicaragua, *S. occidentalis*, sp. n., Acajutla, *S. angusta*, sp. n., Pearl Island, Panama, *S. reticulata*, Say, *cinerea*, Say, and *angustipes*, Dana, are also described. Smith, l. c. pp. 156-160.

Prionoplax ciliatus, sp. n., Panama, Smith, l. c. p. 160.

Euryplax politus, sp. n., Panama; *E. nitidus*, Stimps., redescribed. Smith, l. c. pp. 162-164.

Glyptoplax, gen. nov. Allied to *Eucratopsis*, but differs in the form of the

external maxillipeds, and in the more prominent and horizontal front. From *Speccarcinus* it differs in the form of the carapace and the approximation of the external maxillipeds.—*G. pugnax*, sp. n., Panama, Smith, *l. c.* pp. 164, 165.

Pinnotheres lithodomi, sp. n., Pearl Isl., and *P. margarita*, Smith, redescribed. Smith, *l. c.* pp. 166–169.

Ostracotheres politus, sp. n., Callao, Peru, Smith, *l. c.* p. 169.

Pinnaxodes chinensis (Edw.) described and its parasitism alluded to. Smith, *l. c.* p. 170.

Dissodactylus, gen. nov. A new family is established for this genus, as it differs in the structure of the palate, which is not divided by a median ridge separating the efferent passages. The carapace, the minute eyes, and the narrow abdomen of the male, show its affinity with *Pinnotheres*. *D. nitidus*, sp. n., Panama. Smith, *l. c.* pp. 172–174.

ANOMURA.

Porcellana digitalis, Heller, var. *pontica*, n., Czerniawski, Mater. zoogr. Pont. p. 71. *P. longirostris*, Rathke, is the same species.

Galatea, its larva in the shape of *Zoea* represented by A. Dohrn. Z. wiss. Zool. xx. (4) pl. 32. fig. 27.

MACRURA.

LORICATA.

Scyllarus arctus, F. The development of the embryo within the egg (including its state when first hatched) is described by A. DOHRN; the further metamorphosis could not be followed, but the author thinks that his observations leave no doubt that it will pass through a *Phyllosoma*-like stage before it acquires its definitive form, and that the larva, described and figured by Gegenbaur in the same journal, 1863, pl. 25. figs. 2 & 3, is that of *Scyllarus*, not of *Palinurus*. Z. wiss. Zool. xx. pp. 251–260, pl. 16. figs. 1–7.

Palinurus vulgaris, Latr. The development within the egg, with particular regard to the extremities, the eyes, the nervous ganglia, the heart, and the liver, is described by A. Dohrn, Z. wiss. Zool. xx. pp. 260–271, pl. 16. figs. 8–10.

ASTACINA.

Astacus fluviatilis, Fab. Observations concerning its copulation in the months of Nov., Dec., and January, the oviposition and the moults, are given by M. Chantran, C. R. lxxi. July 1870, pp. 42–45, translated in Ann. N. H. (4) vi. pp. 265–267.

Crayfish, which are red or blue whilst alive, are found in different streamlets of Switzerland: the red colouring is hereditary; the blue occurs only in recently moulted specimens. Bibl. Univ. 15 Mars 1870.

Astacus (Cheraps) preissii (Erichs. 1846) = *Astacoides plebeius* (Hesse, 1865), and does not belong to *Astacoides*. Martens, SB. nat. Fr. 1870, p. 1.

CARIDES.

Crangon maculosus, Rathke, Black Sea, is a variety of *vulgaris*, F. Czerniavski, Mat. zoogr. Pont. p. 126.

Pandalus narwal, Fabr. Some observations respecting its larva in the shape of *Zoea*, by A. Dohrn, Z. wiss. Zool. xx. 4, p. 617, pl. 32. figs. 15-26, and Jen. Z. Nat. v. p. 474.

Virbius gracilis, Heller, var. *intermedia* (young?), and var. *longirostris*, Czerniavski, Mat. zoogr. Pont. pp. 68, 69, pl. 5. figs. 2-7 and 8-24. He states that this species varies very much in the length of the rostrum, and that *Hippolyte viridis* (Otto) and *prideauxiana* are to be included in it.

Fam. — ?

Elaphocaris, gen. nov., new form of larva of an unknown Decapod Crustacean, observed at Messina by A. Dohrn, Z. wiss. Zool. xx. 4, pp. 622-625, pl. 31. fig. 28.

CUMACEA.

Cuma, sp. allied to *C. rathkii* (Kröyer), from the stomachs of Haddocks taken on the shores of East Friesland, shortly described by A. Metzger, l. c. p. 31.

Strachia, gen. nov. Rostrum breve. Segmenta thoracica 5 pone scutum nuda. Antennæ superiores uniflagellatæ; inferiores tenuissimæ, rudimentariæ. Pedum thoracicum in femina paria modo secundum et tertium palpigera; primum secundo brevius et tenuius; quartum et quintum articulis antepenultimo et penultimo setis filiformibus pellucidis præditis, articulo ultimo aculeo unguiformi terminato. Appendix caudalis trunco appendicum lateralium brevior, inermis. Appendices laterales sat elongatæ, ramo interiore biarticulato, exteriore triarticulato, articulis terminalibus tenuissimis, stiliformibus. Oculus magnus.—*S. taurica*, sp. n., Czerniavski, Mat. zoogr. Pont. pp. 64, 65, pl. 5. fig. 1. Female only known.

STOMAPODA.

SCHIZOPODA.

Lophogaster ingens, sp. n., fully described by A. Dohrn, Z. wiss. Zool. xx. 4, pp. 610-617, pl. 31. figs. 12-14, Lagos, W. Afr. This species is very large, 155 millimetres in length, and distinguished from *L. typicus* (Sars) by the form of the shield and the segments of the pleon.

Siriella jaltensis, sp. n., Czerniavski, l. c. p. 66, pl. 4. figs. 12, 13. Closely allied to *S. gracilis*, Dana.

Amphion reynaudi (M.-Edw.). Ovaria and small gills have been found in it by A. Dohrn, which seems to point out that the animal is perfect and undergoes no further metamorphosis; also a larva, pertaining probably to this genus, has been observed. l. c. 4, pp. 607-610, pl. 30. figs. 1-11.

SQUILLIDÆ.

Squilla, sp., from La Guayra, near Caracas, described by A. Ernst, P. Z. S. p. 3.

AMPHIPODA.

A. BÆCK (*l. c.*) gives a full account of the northern *Amphipoda*; but, owing to the late receipt of the paper, an abstract of it must be deferred till next year.

The so-called Leydigian organs on the first pair of antennæ, first observed by La Valette in *Gammarus puteanus*, and afterwards accurately described and stated to be sensitive organs by Leydig, are the subject of a paper by F. JARSCHINSKI (*l. c.*), who has observed them in various genera of Amphipoda.

ORCHESTIDÆ.

Orchestia, sp., from the strand of East Friesland, allied to *A. mediterranea*, and supposed to be perhaps a second male form of *O. littorea*, Leach, is described by A. Metzger, *l. c.* p. 31.

Orchestia botte, M.-Edw., *montagui*, Audouin, and *mediterranea*, Costa, from the Black Sea, figured by Czerniavski, *l. c.* pp. 117, 118, 119, pl. 8. figs. 28–32, 34–39, and 40, 41.—A new variety of *O. botte*, var. *feminaformis*, by the same, p. 118, pl. 8. fig. 39.—*O. deshayesi*, Audouin, var. loc., Czerniavski, *ibid.* p. 131, pl. 8. figs. 52, 53. The female, unknown hitherto, has the hands and claws stronger than usual in this genus. Kertch.

Nicea istricea, Grube, fully described by Czerniavski, *l. c.* p. 114, pl. 8. figs. 24, 25, Black Sea.—*N. perieri* (Lucas), var. *pontica* and var. *brevicornis*, nn., Czerniavski, *ibid.* p. 116, pl. 8. figs. 26, 27, Black Sea.

GAMMARIDÆ.

Gammarus pæcilurus, Rathke, = *gracilis*, Rathke, = *kröyeri*, Rathke, Czerniavski, *l. c.* p. 104, pl. 7. figs. 28–36, Black Sea.

Melita palmata (Montagu) = *Gammarus dugesi*, M.-Edw. (female), described by Czerniavski, *l. c.* pp. 106, 107, Black Sea.

Niphargus, sp., Bate (= *eriopis*, Bruzelius), *N. ponticus*, sp. n., Czerniavski, *l. c.* p. 108, pl. 8. figs. 12–14, Black Sea.—*N. orcinus*, sp. n., Joseph, J.B. Schles. Ges. 1868, p. 22, caves of Carniola.

Bathyporeia, sp., dredged and found in the stomach of haddocks on the coast of East Friesland, shortly indicated by A. Metzger, *l. c.* p. 32.

Pherusa pontica, sp. n., Czerniavski, *l. c.* p. 110, pl. 8. fig. 15, Black Sea; much similar to *Atylus bispinosus*, Bate.—*Ph. inermis*, sp. n.?, *ibid.* p. 111.

Dexamine spiniventris (Costa), var. *pontica*, n., Czerniavski, *l. c.* p. 111, pl. 8. fig. 16, Black Sea.

Probolium (= *Montagua*) *ponticum*, sp. n., Czerniavski, *l. c.* p. 113, pl. 8. figs. 17–23, Black Sea.

CHELURIDÆ.

Chelura pontica, sp. n., fully described by Czerniavski, Mater. zoogr. Pont. pp. 93–95, pl. 7. figs. 1–18. Alupka, Black Sea, with *Teredo navalis*.

DOMICOLÆ.

Podocerus, sp., frequent between Sertulariæ in the estuaries of East Friesland, shortly indicated by A. Metzger, *l. c.* p. 32.

Podocerus dentex, sp. n., Czerniavski, Mater. zoogr. Pont. p. 100, pl. 6. fig. 39, Black Sea.

Cerapus macrodactylus (Dana, as *Pyctilus*), var. *pontica*, n., and *C. pugnar* (Dana), var. *pontica*, n., Czerniavski, l. c. p. 98, Black Sea.

Senamphithoë valida, sp. n., Czerniavski, l. c. p. 101, pl. 6. fig. 36, Black Sea.

Amphithoë vaillantii, Lucas, var. *pontica*, n., Czerniavski, l. c. p. 101, pl. 7. figs. 19–27, Black Sea.

Grubia, gen. nov. Allied to *Eurystheus*, Bate. Antennæ superiores filiformes, pedunculo longo, tribus articulis, primo elongato, secundo et tertio maxime attenuatis, paulisper in flagellum multiarticulatum exeuntes, flagello secundario uniarticulato, rudimentario; antennæ inferiores his breviores, pedunculo longissimo, articulis 4 composito. Pedes paris primi et secundi subchelati, secundi multo majores, fortissimi. Pedes spurii paris postremi biramei, ramis ambobus minutissimis, rudimentariis, antecedentibus paris secundi æquales, paris primi paulo prominentes. Segmenta undecimum et duodecimum spinis subter armata, tredecimum inerme. Telson squamiforme integrum.—*Gr. taurica*, sp. n., Czerniavski, l. c. p. 103, pl. 8. figs. 1–10, Crimea.

LÆMODIPODA.

CAPRELLIDÆ.

Protella typica and *intermedia*, spp. nn., Czerniavski, Mater. zoogr. Pont. p. 91, pl. 6. figs. 7–10 and 11–13, Black Sea.

Caprella protelloides, *ferox*, and *daniilowskii*, spp. nn. Czerniavski, l. c. p. 92, pl. 6. figs. 14, 15, 20, and 21–34, Black Sea.

ISOPODA.

FR. MÜLLER proposes the following arrangement of the families of this order, which, he thinks, will better express the natural affinities between them than that used hitherto:—

Suborder I. "SCHEERENASSELN" (Isopods with hands).

Fam. 1. *Tanaidæ* = *Asellotes hétéropodes* of M.-Edwards.

Suborder II. ISOPODS PROPER.

A. Walking Isopods, *I. marcheurs*, M.-Edw.

a. Ligioids: Fam. 2. *Bopyridæ*.

3. *Oniscidæ*.

b. Aselloids: 4. *Asellidæ* = *Asellotes homopodes* of M.-Edw.

5. *Idoteidæ*.

B. Swimming Isopods, *I. nageurs*, M.-Edw.

Fam. 6. *Cymothoidæ*.

7. *Sphaeromidæ*.

? 8. *Pranizidæ*.

Fr. Müller, Jen. Z. Nat. vi. pp. 66–68.

IDOTEIDÆ.

Idotea tricuspidata, Desm., = *basteri*, Audouin, Rathke, = *acuminata*, Eich-

wald, and *I. capito*, Rathke, = *appendiculata*, Risso, = *lanceolata*, Risso, both in the Black Sea, Czerniavski, *l. c.* pp. 83, 84.

TANAIDÆ.

Tanais vittatus, Rathke, from Millport: the anatomy of the adult animal and the development of the embryo has been observed by A. Dohrn, *Jen. Z. Nat.* v. pp. 293–305, pls. 11 and 12. There are points of similarity in the development with that of *Asellus*, of *Oniscus*, and even of *Cuma*, but also some important differences. The maxillipeds and pereopods are growing in the direction towards the back; and the pleopods make their appearance very late. The eyes are formed close to the median line of the head, and are stalked. The maxillipeds attain a very great development; but the second maxillæ remain rudimentary; hence some difficulties. The branchial appendix is independent of the second maxilla in its first appearance, and is moved by a peculiar muscular apparatus, somewhat analogous to the gills of *Cuma*. The foliaceous appendages of the embryo of *Asellus* are represented in that of *Tanais* by conical lateral processes between the larval membrane and the hepatic region of the embryo, which disappear in the course of development.

Leptochelia. The pleopods of the anterior pairs have a lateral branch. *L. edwardsii* (Kröyer), Black Sea, described by Czerniavski, *l. c.* p. 86.

Paratanais savignyi (Kröyer) described from the Black Sea by the same, p. 88; he admits that it may probably be the female of the preceding.

ÆGIDÆ.

Slabberina gracilis (G. O. Sars), islands of East Friesland, on the strand in tidal rills, shortly described by A. Metzger, *l. c.* p. 32.

Helleria, gen. nov. [Name twice preoccupied among the Crustacea; see *Zool. Rec.* v. pp. 520, 522.] Near *Eurydice*, Leach; body elongated, head large, prominent; eyes large; six abdominal segments, the last large, triangular, rounded. Inner antennæ shorter, outer long. First pair of feet with a feeble hand (chela). *H. pontica*, sp. n., Czerniavski, *l. c.* p. 81, pl. 6, figs. 4–6. [The description is very imperfect; as the other pairs of thoracic feet are not mentioned or figured, its relation to known genera cannot be made out.]

CYMOTHOIDÆ.

Livoneea taurica, sp. n., Czerniavski, *l. c.* p. 129, Crimea.

BOPYRIDÆ.

F. MÜLLER (*l. c.*) distinguishes the following subdivisions in this family:—

1. Fixed externally on the abdomen or the branchial cavity of Decapods; the young individuals have all the thoracic feet similarly formed, and an unequal styliform appendage at the hinder extremity. *Bopyrus*, *Ione*, *Phryxus*, *Gyge*, *Athelgus*, &c., which may all be reunited into one genus.

2. Living within the thoracic cavity of some Brachyura and of *Porcellana*; the last pair of thoracic feet in the larva much longer and differently formed; the abdominal feet of the larva one-branched. *Entoniscus*.

3. Living on Cirripeds. *Cryptoniscus*, Darwin, including *Liriope*, Rathke.

4. Parasitical on Copepods; the third pair of thoracic feet longer than the other, and terminating in an oval lamella, by which the animal fixes itself on its host. *Microniscus*, gen. nov.

Bopyrus resupinatus, sp. n., found in a Pagurid in Southern Brazil, and described by Fr. Müller, *l. c.* pp. 57-60, pl. 3. figs. 4-9; it feeds on *Sacculina purpurea*, Fr. Müll., which is a parasite of the same Pagurid, and it belongs to the subgenus *Ione*. Four other species found in *Leptograpsus*, *Porcellana*, *Alpheus*, and *Hippolyte*, *ibid.* p. 68.

Bopyrus ocellatus, sp. n., Czerniavski, *l. c.* p. 79, pl. 6. figs. 1-3, Black Sea, in the gill-cavity of *Virbius gracilis*, Heller.

Cryptothiria pygmaea (Rathke), the male found free swimming far from the shore in the Black Sea by Czerniavski, *ibid.* p. 78.

Entoniscus porcellanae and *cancrorum*, spp. nn., found in different species of *Porcellana*, *Xantho*, and *Acheus*, in Southern Brazil, and shortly described by Fr. Müller, *l. c.* pp. 53-56, pl. 3. figs. 1-3.

Cryptoniscus planarioides, sp. n., in the same Pagurid with *Bopyrus resupinatus*, described and figured by Fr. Müller, *l. c.* pp. 61-64, pl. 4. figs. 12-19.

Microniscus fuscus, sp. n., on the back of a Copepod, *ibid.* p. 65, pl. 4. fig. 20.

PHYLLOPODA.

VERRILL (*l. c.*) gives a fuller account of his researches on *Branchipus* and *Artemia* (Zool. Rec. vi. p. 617). *B. vernalis*, Verrill, is made the type of a new generic division, *Eubbranchipus*; *Heterobranchipus*, Verrill, is recognized as = *Streptocephalus*, Baird, 1854.

CLADOCERA.

DAPHNIIDÆ.

The morphology of the hard parts, the process of moulting, and the description of venous sinuses are noticed by F. PLATEAU, *Mém. Ac. Belg.* xxxv.; abstract in *Ann. N. H.* (4) v. p. 367.

Hyalosoma, gen. nov., described by Nic. Wagner in Russian, in 'Trans. Russ. Natur. S. Pet.' *H. dux*, sp. n., pp. 218-238, pls. 1-4, 1868. He says that it is distinguished from all known Daphniidæ by the solidity of its test, the lengthened form of its body, the strong jaws, six pairs of strong feet, and the articulated postabdomen. Its biological functions, however, are not in accordance with this high degree of morphological development; the intestinal tract is a simple tube, wanting the hepatic sacs; the postabdomen is not used as an organ for swimming, the feet are nearly immobile and quasi "petrified," and it moves slowly on the mud at the depth of about two feet; it has been found in the lake Boltschoi-Kaban, near Kasan, in July. The

author puts it forward as a striking example of morphological progress without adaptative modification, and therefore destined to disappear!

POLYPHEMIDÆ.

Evadne nordmanni, Lovén, var. *jaltensis*, n., Czerniavski, Mat. zoogr. Pont. p. 57.

Podon, Lilljeborg, the generic character emended with regard to the presence of outer appendages in the last three pairs of feet, and *P. meznikovii*, sp. n., described by Czerniavski, l. c. pp. 58-60, pl. 8. fig. 47-51.

Pleopis schædlerii, sp. n., Czerniavski, l. c. p. 60.

OSTRACODA.

CYPRIDIDÆ.

Cypris ventricosa, *tumefacta*, *fretensis*, sp. n., Brady, Ann. N. H. (4) vi. pp. 12-13, pl. 4. figs. 1-3, 4-6, and 7-9, tidal rivers and lakes in Northumberland, the last also in the Meuse and Scheldt.

Cypridopsis? newtoni, sp. n., Brady, l. c. p. 14, pl. 7. figs. 14-16, tidal rivers and lakes in Northumberland.—*C. obesa*, Brady, is probably a variety of *vidua*, Müll. ibid. p. 15.

Gonicypis, gen. nov. Valves compressed, subequal, thin and fragile. Seen from the side triangular, the inferior margin terminating at each extremity in an acutely produced angle, the superior margin rising to an acute central point; hinge simple. Animal unknown.—*G. mitra*, sp. n., Brady, l. c. p. 15, pl. 7, figs. 10-13, tidal rivers and lakes of Northumberland.

Argillecia? aurea, sp. n., Brady, l. c. p. 16, pl. 8. figs. 4, 5, river Ouse at Lynn.—*A. meridionalis*, sp. n., Brady in Berchon and Folin, Fonds de la Mer, p. 198, pl. 27. figs. 9, 10, Magellan Straits.

Candona candida (Müll.), var. *tumida*, new var., *C. kingsleyi*, *diaphana*, and *hyalina*, spp. nn., Brady, l. c. pp. 16-19, pl. 9. figs. 13-15, 9-12, 5-8, pl. 5. figs. 1-3 and 4-11, tidal rivers and lakes of Northumberland.

Bairdia fasciata, sp. n., Cape-Verde Islands; *angulata* and *dewatrei*, spp. nn., Magellan Straits. Brady in Berchon and Folin, Fonds de la Mer, p. 193, pl. 19. figs. 20, 21; p. 199, pl. 27. figs. 11, 12 and 17, 18.

Metacypris, gen. nov. Shell moderately strong and thick, excessively tumid; ventral surface deeply impressed along the central and posterior portions of the median line. Hinge formed on the right valve by a laminated angular projection anteriorly, posteriorly by a strong rectangularly produced flange, from which projects a single sharply cut tooth; on the left by a deep sulcus behind and a shallower one in front.—*M. cordata*, sp. n., Brady, l. c. p. 19, pl. 6, tidal rivers and lakes in Northumberland, also in the Meuse and Scheldt. Animal not known; therefore it remains doubtful whether it is to be placed among the Cypridæ or the Cytheridæ.

CYTHERIDÆ.

Cythere. Four species inhabiting the Black Sea mentioned; one of them, *C. nigrescens*, Baird, figured by Czerniavski, Mat. zoogr. Pont. p. 62, pl. 4. fig. 11.

Cythere fidicula, sp. n., Brady, l. c. p. 21, estuaries of the rivers Thames,

Scheldt, and Meuse.—*C. canadensis* and *dawsoni*, spp. nn., Brady, *l. c.* pp. 452, 453, pl. 19. figs. 4-6 and 8-10, Gulf of St. Lawrence; *C. leioderma*, Norman, from the same locality, described and figured, *ibid.* p. 451, figs. 11-13.

Cythere silicula and *margaritifera*, spp. nn., Vera Cruz; *curvistriata*, sp. n., Cape Verde Islands; *spongiosa* and *solandii*, spp. nn., Pulo Pinang; *margollei*, *murcheri*, *contracta*, and *cubioidea*, spp. nn., Magellan Straits. Brady in Berchon and Folin, *Fonds de la Mer*, parts xii. and xiii. pp. 192-201, pl. 27. figs. 1-4, pl. 19. figs. 22, 23, pl. 28. figs. 1-4, pl. 27. figs. 5, 6, 13, 14, and 17-22.

Cytheridea torosa (Jones), var. n., and *inæqualis*, sp. n., Brady, *Ann. N. H.* (4) vi. pp. 21, 22, pl. 8. figs. 6, 7, and pl. 9. figs. 1-4, Northumberland. *C. littoralis*, Brady, is a variety of the former, *ibid.* footnote.

Loxconcha pusilla, sp. n., Brady, *l. c.* p. 23, pl. 8. figs. 1-3, Frith of Forth, some rivers in Norfolk, and Scheldt.—*L. fragilis*, G. O. Sars, *ibid.* p. 24, pl. 10. fig. 3, Montrose Basin and Budle Bay.

Cytherura propinqua, sp. n., Brady, *l. c.* p. 24, pl. 10. figs. 1, 2, Thames estuary.—*C. undata*, Sars, var., from the Gulf of St. Lawrence, Brady, *ibid.* p. 454, pl. 19. fig. 7.

Cytherideis foveolata, sp. n.; Brady, *l. c.* p. 454, pl. 19. figs. 1-3, Gulf of St. Lawrence.

*Polycheles**, gen. nov. Shell fragile, structureless; lucid spots ten to twelve, arranged in a subradiate manner. Right valve much larger. Superior antennæ 6-, inferior 4-jointed, and bearing strong terminal claws. First maxilla furnished with eight long and strong curved setæ, and with a long biarticulate digit, which terminates in four curved claws. Third pair of feet much the longest, armed with two strong curved claws and one shorter seta. *P. stevensoni*, sp. n., Brady, *l. c.* p. 25, pl. 7. figs. 1-7, and pl. 10. figs. 4-14, tidal rivers and lakes of Northumberland, also in the Scheldt.

CYTHERELLIDÆ.

Cytherella cuneolus, sp. n., Cape Verde Islands, and *similis*, sp. n., Magellan Straits. Brady, in Berchon and Folin, *Fonds de la Mer*, parts 12 and 13, pp. 199, 202, pl. 19. figs. 18, 19 and 16, 17.

Xestoleberis polita, sp. n., Brady, in Berchon and Folin, *Fonds de la Mer*, p. 202, pl. 27. figs. 15, 16, Magellan Straits.

ENTOMOSTRACA.

COPEPODA.

CYCLOPIDÆ.

F. PLATEAU gives several physiological observations and experiments concerning this family, and especially *Cyclopsine castor* (Jurine), having employed Ehrenberg's carmine process. Each eye has its proper optic ganglion. The heart, the genital orifices, and the glands by which the ovisac is formed are described. Electrical discharges of moderate intensity do not kill the animal, but make it motionless for some time. *Cyclops quadricornis* (Müll.) dies in sea-water after a few minutes,

* Preoccupied by C. Heller, 1862, in *Crustacea*.

Daphnia sima (Müll.) [*Simocephalus*] after a quarter of an hour. *Mém. Ac. Belg.* xxxv., and *Ann. N. H.* (4) v. pp. 367–372.

Cyclopsina clausii, sp. n., Czerniavski, *Mater. zoogr. Pont.* p. 39, pl. 1. figs. 1–8.

HARPACTIDÆ.

Tisbe furcata, Baird. The variations of the female described by Czerniavski, *Mater. zoogr. Pont.* pp. 41, 42, pl. 1. figs. 9–18. The female is common, the male very rare.

Cleta uncinata, sp. n., Czerniavski, *l. c.* pp. 42, 43, pl. 1. figs. 19–29.

Dactylopus cinctus, a new variety, and *D. brevifurcus*, sp. n., Czerniavski, *l. c.* p. 44, pl. 2. figs. 1, 2, 9–12.

Thalestris pontica and *brevicornis*, spp. nn., Czerniavski, *l. c.* pp. 46, 48, pl. 2. figs. 13, 23, 24, pl. 3. figs. 1, 2.

Harpacticus nicænsis, Claus, *varietas fortior*, Claus, *variatio pontica*, n., Czerniavski, *l. c.* p. 49, Black Sea.

PELTIDIDÆ.

Alteutha typica and *aberrans*, spp. nn., Czerniavski, *l. c.* pp. 50, 53, pl. 3. figs. 15–25, 26–38, Black Sea.

PONTELLIDÆ.

Pontella brunescens, sp. n., Czerniavski, *l. c.* p. 54, pl. 4. figs. 1–9, Black Sea.

Pontellina mediterranea, Claus, *varietas jaltensis*, n., Czerniavski, *l. c.* p. 55, pl. 3. figs. 29–32, Black Sea. Perhaps a distinct species.

NOTODELPHIDÆ.

Polychliniophile [*Polyclinophilus*] *similis*, sp. n., Hesse, *Ann. Sc. Nat.* (5) xi. 1869, p. 289, Port Napoléon, in a species of *Polyclinum*.

Cryptopode [-pus] *angustus*, sp. n., Hesse, *ibid.* p. 290, in a compound *Ascidia*.

Botryllophilus armatus, *purpurescens*, and *brevis*, spp. nn., Hesse, *ibid.* pp. 293–295, in several species of *Botryllus*.

Botachus macroone and *fulvus*, spp. nn., Hesse, *ibid.* pp. 296–298, in *Ascidia canina*. Both differ from the typical species, *B. cylindratus*, Thorell, by the abdomen being adapted for propulsion, not for prehension.

Adranesius elatus, sp. n., Hesse, *ibid.* p. 298, in an *Ascidia*.

Lygephile [-us] *microcephalus* and *roseus*, spp. nn., Hesse, *ibid.* pp. 300–305, within compound *Ascidie*.

Doropygus spherasipherus and *globosipherus*, spp. nn., Hesse, *ibid.* pp. 305–308, within compound *Ascidie*.

All these parasitical Crustacea have been found by the author on the coasts of France, in various months of the year 1868; but the special localities are not indicated.

Aplopode, gen. nov., Hesse, *Ann. Sc. Nat.* (5) xi. pp. 287–289. Male unknown. Body of the female cylindrical, rounded at both extremities; head triangular, with a median eye; mouth tubiform, surrounded by two small maxillipeds and denticulated mandibles; antennæ short, cylindrical, 3-articu-

lated; thorax 4-articulated; *thoracic feet simple*, flat, triangular, terminated by a claw; two-pointed corneous prolongations at the extremity of the abdomen.—*A. rufus*, sp. n., found in the interior of a social Ascidian. [Rectius *Haplopus*, but then preoccupied.]

SIPHONOSTOMA.

The parasitical Crustacea living on Annelids have been among the last subjects of study to two observers of first rank, both now deceased, M. Sars and E. CLAPARÈDE. The latter has revised the known genera from the original descriptions, and in comparison with his own observations. He arranges them as follows:—

1. *Pæcilotoma*, Thorell (*Ergasilidæ*):—*Selius*, Kröyer, 1837; *Terebellicola*, Sars, 1861; *Sabelliphilus*, Sars, 1861; *Chonephikus*, Sars, 1861.

2. *Siphonostoma* proper (*Caligidæ* and *Lernæidæ*):—*Silenium*, Kröyer, 1863; *Herpyllobius*, Steenstrup and Lütken, 1861, perhaps the same as the preceding; *Sabellacheres*, Sars, 1861; *Nereicola*, Keferstein, 1863; and *Cheilonidiformis*, Hesse, 1869. Ann. Sc. Nat. (5) xiii. pp. 1-9. M. Sars adds two new genera, and identifies *Selius* with *Silenium*, Kunds. Christ. Faun. p. 1.

ERGASILIDÆ.

Bomolochus belones (Burmeister). The subject of a careful morphological and anatomical description by Rob. Hartmann, Arch. Anat. Phys. 1870, pp. 116-153, pls. 3, 4. He found this parasite on the inside of the opercula of the Sea-pike or Gar (*Belone*), as well in the Mediterranean as in the German Sea.—*B. ostracionis*, sp. n., Richiardi, Arch. p. Zool. ii. pp. 47-59, pl. 1, fully described, from the inside of the gill-opening of *Ostracion cornutus*, from Mozambique.

Sabelliphilus sarsii, sp. n., Claparède, Ann. Sc. Nat. (5) xii. p. 10, pls. 7-15, Naples, on the body of *Spirographis spallanzanii*. The species is fully described, and the genus stated to be very nearly allied to *Lichomolgus*, Thorell.

CALIGIDÆ.

Caligus [?] *hyalinus*, sp. n., Czerniavski, Mater. zoogr. Pont. p. 56, pl. 8. figs. 45, 46, free-swimming between Algæ.

Silenium crassirostris [-e], sp. n., M. Sars, l. c. p. 2, pl. 8. figs. 10-15. Corpus *feminae* sacciforme, subglobosum, album, levissimum, antennis pedibusque destitutum. Acetabulum in media fere longitudine corporis situm, tubulosum, valde crassum, crassitudine tertiam ferme partem latitudinis corporis æquante. Sacculi ovigeri ignoti. *Mas* minutissimus forma *Cyclopis*, cephalothorace latiore, quadriarticulato, antice in acetabulum elongatum conico-acuminatum producto; cauda graciliore, triarticulata, appendicibus duabus (furca) brevibus crassiusculis, setis 3 natatoriis armatis prædita. Antennæ nullæ. Maxillipedes duo triarticulati, articulo ultimo hamato. Tria paria pedum natatoriorum, biramosorum, ramis uniarticulatis, exteriore ad apicem setis natatoriis 5, interiore illo breviori setis 2 prædita. Drobak, near Christiania, on the back of *Polynoe dispar*.

Eurysilenium, gen. nov., Sars, *l. c.* pp. 5-11, pl. 9. figs. 16-22. *Femina*: corpus breve, latum, subtrapezoideum, haud segmentatum, antennis pedibusque destitutum. Acetabulum ventrale minutum, tubulosum. Sacculi ovigeri duo maximi, non extremitate sed paulo infra eam corpori affixi. *Mas* minutissimus elongatus, distincte segmentatus, acetabulo sat magno tubuloso in ventre segmenti primi sito, extremitate corporis posteriore uncinis duobus corneis, mobilibus, retro porrectis prædita, antennis pedibusque nullis.—*E. truncatum*, sp. n., Drobak, near Christiania, on the back or hinder end of *Polynoe cirrata*.

Chelonidiformis, gen. nov., Hesse, *Ann. Sc. Nat.* xi. pp. 275-286, pl. 1. Male unknown. Body of the female hemispherical, without articulations; no eyes; antennæ simple, nodulous, 6-articulated; head distinct from the trunk; three pairs of maxillipeds, the first long, terminated by sharp points; mouth small, conical, with digitated mandibles, and surrounded by flat, falciform, pointed laminae; three pairs of thoracic feet, which are two-branched, small, and of unequal size, and terminated by sharp points; abdomen prominent, sacciform; matrical apertures very large; two oval ovisacs.—*Ch. typicus*, sp. n., found fixed on fragments of *Arenicola piscatorum* on the [northern?] coast of France. The author proposes for it a new family, with the name "Annelidicoles."

ANTHEACHERIDÆ.

M. Sars, *Kundsk. Christ. Fauna*, pp. 37-41, proposes this new family on the following characters:—Body of the females thick, divided into distinct segments, which, however, are immobile; feet rudimentary. The animals live parasitically, feeding on the blood of other animals, for example, Actiniæ, and even fishes, but are not affixed to them. The males are not so much smaller than the females as in the Lernæidæ. To it belong *Staurosoma*, Will., *Antheacheres*, Sars, 1856, and *Philichthys*, Steenst. 1861.

LERNÆIDÆ.

Melinnacheres, gen. nov., M. Sars, *l. c.* pp. 11-16, pl. 8. figs. 1-9. *Femina*: corpus oblongum, ventricosum, *distincte segmentatum*, antennis pedibusque destitutum. Acetabulum minutum, breviter tubulosum, sub primo segmento (capite) situm. Sacculi duo ovigeri tenues, cylindrici, longissimi, ovulis biserialibus. *Mas* minutissimus, ovalis, ventricosus, segmentatus, antennis superioribus bene evolutis, articulatis, setigeris, inferioribus parvis tenuibus uniarticulatis, aduncis, pari unico maxillipedum validorum, pedibus natatoris nullis.—*M. ergasiloides*, sp. n., Drobak, near Christiania, on the bristle-bearing appendices of *Melinna* (*Sabellides*) *cristata*. This genus is intermediate between the Caligidæ and Lernæidæ, or, as the author says, a Lernæid with segmented body.

Nereicola ovata, Keferst. This parasite, living on *Nereis cultrifera*, Grube, is the subject of a paper by W. C. Mackintosh, *J. Micr. Sc.* (2) no. xxxvii. Jan. 1870, pp. 39-41, pl. 5. He did not know that it was described, but fortunately did not rename it. He also describes the male, before unknown; it has two pairs of feet and a caudal fork.

Pennella orthagorisci, sp. n., Wright, *Ann. N. H.* (4) v. p. 44, pl. 1, Cork Harbour, on *Orthagoriscus mola* (L.).

Lernæocera barnimii, sp. n., Hartmann, Arch. Anat. Phys. 1870, pp. 726-752, pls. 17, 18. Fixed on the scales of *Labeo niloticus* in the Nile. It has five pairs of natatorial feet, the four anterior pairs bearing two, the last one branch; the chitinous integument is traversed by numerous microscopical channels, which are not in connexion with any gland, and do not perforate the "hypodermis;" the musculature, the maxillæ, the intestinal tract, the ovaries, and the embryos, which are similar to those of *Cyclops*, are described. A previous notice on the same subject is given in SB. nat. Fr. 1870, p. 60, where it is also remarked that similar channels within the chitinous integument have been observed in *Cecrops* and *Caliopus*.

Lernæa branchialis (L.). A. Metzger, referring to his former paper on the subject (see Record, vol. iv.), states that the former *Cyclops*-like stages of this animal are found frequent on the gills of *Pleuronectes flesus*, the transitional stages to the later form of the female on *Cyclopterus lumpus*, *Gadus merlangus* and *morrhua*, in February and March, on the coast of East Friesland. JB. Ges. Hannov. no. xx. for 1869-70, p. 33.

CIRRIPIEDIA.

Prof. CLAUS's researches into the second or pupa-stage of Cirripeds, when they somewhat resemble *Ostracods*, for the most part confirm DARWIN's, especially in some points on which PAGENSTECHER (Z. wiss. Zool. 1863) expressed a different opinion; but, in interpreting the homology of the appendicular organs, Claus urges that the frontal processes which fix the animal are not homologous to antennæ, because in the larvæ of the lower Crustaceans the latter generally appear as natatorial feet. The first unbranched pair of natatorial feet is homologous to the first pair of antennæ, and the second pair of feet with two branches to the second pair of antennæ, but the homology of the third pair of feet to the maxillary organs is still to be made out. The six pairs of cirrated feet of the perfect Cirriped are homologous to the five pairs of natatorial feet, and to the protuberance of the genital segment of the perfect Copepod. The nervous system of the larva is described; and the conical protuberance in front is said to be a sensitive organ, and is identified with the opening of Darwin's auditory organ. The cement-glands and their excretory ducts are less developed in *Lepas pectinata* and *L. fascicularis* (pl. 1. f. 2) than in *Conchoderma virgatum* (pl. 1. f. 3), and in another larva of large size, which is not systematically determined, but furnished the chief material of this paper, and is figured. Schr. Ges. Marb. v. (1869) Suppl. pp. 1-17, pls. 1, 2.

Archezoa gigas, nov. gen. and sp. Four to five millims. in size. A new form of larva of Cirripeds, distinguished by a glandular apparatus within the shield, and six pairs of movable spines, from the sea, near Chile. A. Dohrn. Z. wiss. Zool. xx. 4, pp. 597-606, pls. 28, 29.

Balanus improvisus, Darwin, and an undetermined species, similar to *de-clivis*, Darwin, in the Black Sea. Czerniavski, Mat. zoogr. Pont. pp. 63, 64.

PELTOGASTRIDÆ.

Sylon, Kröyer, 1855, redescribed. Corpus sacciforme, ovatum, subteres, cute (pallio) pellucida, sed firma vestitum. Os vel apertura suctoria in organo adfigendi acetabuliformi, annulo corneo cincto, in latere inferiore corporis situm, ubi in posteriore parte *apertura (genitales) binæ* parvæ circulares beantes [hiantes], symmetricè positæ, cavitatem intrapallialem aperientes, adsunt. Genitalia bisexualia: ovarium ramosum in sacco magno maximam partem cavitatis intrapallialis explente inclusum; testiculus parvus, ovatus, in posteriore parte ventrali hujus cavitatis situs.—*S. hippolytes*, Kröyer, on the underside of the third abdominal segment of *Hippolyte securifrons*, and *S. pandaki*, sp. n., on the underside of the first abdominal segment of *Pandalus brevirostris*, at Dröbak, near Christiania. M. Sars, Kunds. Chris. Faun. pp. 41-48, pl. 10. figs. 54-59, 60-63.

Sacculina. A full abstract of GERBE's paper on the development of the eggs is to be found, Ann. N. H. (4) v. pp. 140-144. Balbiani, C. R. 1869, December, and Van Beneden, C. R. 1870, Feb., oppose several of his views. Further, Balbiani opposes, and Van Beneden maintains, that the polar cellula is detached from the mature egg, and remains within the ovary, giving origin to a new egg, and that there is no other second vesicle near the vesicle of Purkinje in the egg of *Sacculina*. C. R. 1870, pp. 197-199.

ARACHNIDA

BY

The Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S.

LIST OF PUBLICATIONS.

AFFLECK, THOMAS. On Spider and Mud-Wasp. Am. Nat. 1869, iii. p. 391.

A letter preserved in the Library of the Boston Society of Natural History, records "the attack, capture, and destruction of a very large spider by a small blue mud-wasp," which pursued its prey by scent.

BERTKAU, PHILIPP. Ueber den Bau und die Function der Oberkiefer bei den Spinnen; und ihre Verschiedenheit nach Familien und Gattungen, mit einem Tafel. Arch. f. Nat. 1870, pp. 92-126, Taf. ii.

An interesting paper, treating specially upon the structure and use of the *falces* of spiders. That part of a large number of known species of various recognized families and genera is described, and an analytical table of these (based upon differences in the structure of the *falces*) is given.

BLACKWALL, JOHN. A list of Spiders captured by Professor E. Perceval Wright, M.D., in the province of Lucca, in Tuscany, in the summer of 1863, with characters of such species as appear to be new or little known to Arachnologists. P. L. S. x. pp. 405-434, tabb. xv. & xvi.

Records 68 species, of which 19 are described as new.

— Notes on a collection of Spiders made in Sicily in the spring of 1868, by E. Perceval Wright, M.D., with a list of the species, and descriptions of some new species and of a new genus. Ann. N. H. (4) June 1870, pp. 392-405, pl. viii.

This is, in fact, *two* papers,—the notes by Dr. Wright, the list and descriptions by Mr. Blackwall. The notes are brief, chiefly upon the locality in which the spiders were found (at an elevation of about 3000 feet in the immediate neighbourhood of Nicolosi). The List contains 27 species, of which 7 are described as new, one forming the type of a new genus, *Ctenophora*, with which and *Galena*, C. Koch, Mr. Blackwall constitutes a new family, *Ctenophoridae*.

BORRE, A. PREUDHOMME DE. Ann. E. Belg. compt. rend. p. ii. 1869-70.

Communicates a note on the contested point how spiders project their lines in various directions without intervening objects. A paper, "How Spiders begin their snares," by B. J. Wilder, Am. Nat. ii. 1868, p. 214, was referred to as confirming the observations published two years since by M. Terby (Elève de la Faculté des Sciences de Louvain), an analysis of whose work is given in Ann. E. Belg. Séance de Nov. 1867, by M. le Dr. Breyer.

BUCKHOLZ, R. Bemerkungen über die Arten der Gattung *Dermaleichus* (Koch). Ver. L.-C. Ak. xxxv. pp. 1-56, mit 7 Taf., 1870.

Gives an analytical table of the species of *Dermaleichus*, and describes 21 as new.

BULLER, WALTER. On the Katipo, or venomous Spider of New Zealand. Tr. N. Z. Inst. 1870, iii. pp. 29-34.

Contains notes on the distribution &c. of the "Katipo," with a description of both sexes, and of the cocoon and eggs. Cases of the Katipo's bite are also detailed, with symptoms and medical treatment.

CAMBRIDGE, O. P. Descriptions and sketches of two new species of Araneidea, with characters of a new genus. P. L. S. x. pp. 398-405, pl. xiv.

Introduction contains observations on the systematic position of 4-eyed spiders, describes *Miagrammopes*, nov. gen., and questions the propriety of forming *tribes* solely characterized by the number of the eyes.

——. Monograph of the genus *Idiops*, including descriptions of several species new to science. P. Z. S. 1870, pp. 101-108, pl. viii. ad partem.

The identity of *Idiops*, Perty, with *Acanthodon*, Guérin, is pointed out, as well as the confusion of the former with *Sphasus* by Walckenaer. The genus is characterized at length, and descriptions are given of 5 species, of which 3 are considered to be new.

——. Supplementary notice on the genus *Idiops*. P. Z. S. 1870, pp. 152-157, pl. viii. ad partem.

Contains descriptions of 3 new species additional to those described in the foregoing paper.

——. On some new genera and species of Araneidea. P. Z. S. 1870, pp. 728-747, pl. xlv.

Characterizes ten new genera and species of *Drassides*, *Agelenides*, *Theridides*, *Epeirides*, *Thomisides*, *Myrmecides*, and —? from Bombay, Natal, Ceylon, and Brazil.

——. Notes on a collection of Arachnida made by J. K. Lord, Esq., in the peninsula of Sinai and on the African borders of the Red Sea. P. Z. S. 1870, pp. 818-823, pl. l.

Records 19 species of *Araneidea*, of various families and genera (3 species being described as new), two species of *Solpugidea* and two of *Scorpionidea*.

CAMBRIDGE, O. P. Bibliographical Notice. Ann. N. H. Nov. 1870, pp. 414-417.

Reviews and criticises T. Thorell's work on European Spiders, Part I., N. Act. Ups. (3) vii. fasc. i. & ii. (and Zool. Rec. vi. p. 143), shows that the fam. *Omanoidæ*, Thor., is based on a misconception as to the identity of *Æcobius navus* (Blackw.); states that the character of geometric web-spinning is not an unvarying one in the *Epeirides*, nor the possession of but two terminal tarsal claws invariable in the *Thomisides*—*Arcys*, Walck., an acknowledged Thomisid, having three. A striking and hitherto unnoticed character of *Palpimanus*, Dufour, is stated to be the possession of but two spinners. The propriety is questioned of founding a new family, *Otiathopoidæ*, for *Otiathops*, Macleay (which is exceedingly closely allied to *Palpimanus*, Duf.), merely on account of an abnormal number of joints in the legs of the first pair. This character, as in *Hersiliola*, Thorell, = *Hersiliada* (Simon), is considered only generic.

—, Descriptions of some British Spiders new to science, with a notice of others, of which some are now for the first time recorded as British species. Tr. L. S. xxvii. pp. 393-464, tabb. 54-57 (read 20 Jan. 1870).

Contains descriptions and notices of 85 species, of which 53 are described as new, and 15 are recorded for the first time as British.

CANESTRINI, GIOVANNI, & PAVESI, PIETRO. Catalogo sistematico degli Araneidi Italiani. Arch. p. Zool. ii. pp. 60-64, 1870, tavv. iii. & iv.

An enlargement of the synonymic list by the same authors ("Araneidi Italiani," Atti Soc. Ital. xi. pp. 758-872, and Zool. Rec. vi. p. 141), omitting for the most part the synonyms, but extending the notices of distribution within the kingdom of Italy. The catalogue contains 473 species, of which 3 are described as new. Figures are given of 17 species.

EMERTON, J. H. The *Lycosa* at home. Am. Nat. iv. p. 664.

The nest of a *Lycosa* observed in New York described (cf. Rec. Am. Ent. 1870, p. 26).

HAGEN, H. Synopsis Pseudoscorpionidum Synonymica. P. Bost. Soc. 1870, xiii. pp. 263-272.

Nine established genera are recognized as tenable—*Blothrus*, Schiödt, *Checridium* and *Chernes*, Menge, *Chthonus*, Koch, *Eucarpus*, Dalman, *Microblabius*, Corda, *Obisium*, Illiger, *Pelorus*, Koch, and *Pseudoscorpio*, Latr. To the above, 50 known species are referred, all others being regarded as synonyms.

HASSETT, A. W. M. VON. Studien over den *Pholcus opilionoides* (Schränk). Tijdschr. Ent. (2) 1870, pp. 159-174.

An interesting general paper on the habits, economy, and distribution of *Pholcus opilionoides*, with remarks on some other allied species, but containing nothing particularly new or remarkable.

KOCH, LUDWIG. Die europäischen Arten der Arachniden-gattung *Cheiracanthium*. Abh. Ges. Nürnberg. 1864, pp. 137–162.

——. Die Arachnidengattungen *Amaurobius*, *Caelotes* und *Cybaeus*. Abh. Ges. Nürnberg. 1868, pp. 1–52, 2 Taf.

These papers were noticed in the "Review of Publications," Zool. Rec. vi. p. 142, but not in the "Special Part." Containing full descriptions of the species (including some new to science), together with the characters of the genera, it is thought proper to notice them again now.

——. Beiträge zur Kenntniss der Arachidenfauna Tyrols. Z. Ferd. 1869, pp. 149–206.

Contains characters of a new genus, *Hophtes*, fam. *Opiliones*, with 17 new species of *Phalangidea*, and 16 of *Araneidea*.

——. Beiträge zur Kenntniss der Arachnidenfauna Galiziens. JB. Ges. Krakau, xli. 1870, pp.

Gives a catalogue of the Arachnida of Galicia captured by Prof. Nowicki, chiefly at Bukowina and the Tatragebirge. Comprises 169 species of *Araneidea* (of which 18 are described as new), 16 species of *Phalangidea* (1 being described as new), and 4 species of *Acaridea*.

M'INTYRE, L. J. *Cheyleti*. Sc. Goss. No. 109, p. 5.

Describes with great force and vividness the carnivorous habits of *Cheyletus*, a genus of Acarids. Two species are described, but neither is named or specifically determined.

——. Pseudo-scorpions. Sc. Goss. No. 59, pp. 243–247.

Details at length some interesting facts relative to the economy and structure of *Obisium* and *Chelifera*.

METSCHNIKOFF, ELIAS. Embryologie des Scorpions. Z. wiss. Zool. Bd. xxi. pp. 204–232, Taf. xiv.–xvii.; also separate, pp. 1–29, and 4 plates. Leipzig: 1870.

Reviews shortly the works on this subject of John Müller, Rathke, Duvernoy, L. Dufour, and Ganin, and traces the embryo of *Scorpio italicus* from the earliest period of its development.

NOWICKI, M. Beschreibung neuer Arthropoden. JB. Ges. Krakau, 1870, p.

Describes a new species of *Phalangidea*.

PACKARD, A. S., JUNR. A chapter on Mites. Am. Nat. iii. pp. 364–473, pl. 6.

A general paper on the structure, habits, and economy of some of the Acarids. The author, p. 365, states his object to be "to indicate a few of the typical forms of mites, and sketch, with too slight a knowledge to speak with much authority, an imperfect picture of their appearance and mode of

living." This object appears to be achieved in an interesting and popular manner.

PAVESI, PIETRO. [See CANESTRINI, G.]

POWELL, LLEWELLYN. On *Latrodectus katipo*, the poisonous Spider of New Zealand (with illustrations). Tr. N. Z. Inst. iii. 1870, pp. 56-59.

Describes the affinities and characteristics of the above spider, and gives it the provisional specific name of "*katipo*."

SANBORN, F. G. P. Bost. Soc. 1870, xiii. p. 208.

Remarks that "a great number of Arachnida, mostly of small size, were noticed struggling in water of about $\frac{1}{2}$ inch in depth covering the surface of the ice in meadows, and appeared to represent many species."

SIMON, EUGÈNE. Sur les Aranéides de la famille des Enydes, qui habitent l'Espagne et la Maroc. R. Z. Dec. 1869, pp. .

Forms a new family *Enydes* out of *Lachesis*, Savigny, *Enyo*, Sav. (= *Clotho*, Walck. ad partem), and *Miltia*, gen. nov. Sim. (= *Enyo*, Lucas, ad partem), *Enyo amarantina*, Luc., being the type of n. g. *Miltia*.

— Aranéides nouveaux ou peu connus du midi de l'Europe, 1^{re} Mémoire. Mém. Liège, 1870, pp. .

Characterizes a new genus, *Peltosoma*, fam. *Epeirides*, and describes 49 new species of various genera and families.

THORELL, T. Remarks on synonyms of European Spiders. Nos. 1 & 2, pp. 1-228. Upsala, London & Berlin. No. 1, 1870; No. 2, 1871.

This important work (not yet complete) is, in fact, a continuation of that by the same author, on European Spiders (*vide* Zool. Rec. vi. p. 143), which thus forms the introduction to the present work (*conf.* Thorell, Europ. Spid. p. 234, note). As the object of that was to review the *genera* of European spiders, so the object of the present is to examine and, as far as possible, determine the *synonyms*, and thus "to fix the nomenclature of the spiders described in Westring's '*Aranæ Suecicæ*,' as also of some other European species, partly described in the '*History of British and Irish Spiders*,' by J. Blackwall, London, 1861-64, partly registered in the '*Catalogue synonymique des Aranéides d'Europe*,' given by M. Eugène Simon in his '*Histoire Naturelle des Araignées*,' Paris, 1864."

In the present numbers (1 & 2), which deal primarily with Westring's genera and species, as far as and including *Sparassus*, the author's proposition has been admirably carried out. The greatest care and honesty has been used in determining the identity of species described by various authors; descriptions as well as typical examples from different parts of Europe have been compared with great pains and acumen; the specific as well as generic names which the author conceives to have the priority are in each case placed within brackets immediately after the name borne by the genus or species in the work primarily under review; and not the least valuable part of the lists of synonyms is the *date*, prefixed to each (both genus and species), at which

the name was published, showing at a glance the evidence on which priority has been determined. This work is quite indispensable to the student of European spiders.

THORELL, T. *Aranæ nonnullæ Novæ Hollandiæ descriptæ*.
 Œfv. Vet. Ak. 1870, No. 4, pp. 367-389.

Characterizes two new genera, *Hemiclea* and *Voconia*, fam. *Thomisides*, and ten species of these and other recognized genera.

WRIGHT, F. W. On the Katipo, a poisonous Spider of New Zealand. Tr. N. Z. Inst. ii. 1869, pp. 81-84.

Details the effects of the bite of this spider (a species of *Latrodectus*), and of the remedies used against it.

ARANEIDEA.

THERAPHOSIDES.

Idiops, Perty, = *Acanthodon*, Guérin, + *Sphasus*, Walck. ad part.

Sphasus idiops, Walck., = *Idiops fuscus*, Perty. O. P. Cambridge, P. Z. S. 1870, pp. 101-103.

Idiops kochii, Pebas, S. America, *I. sigillatus*, Swan River, W. Australia, and *I. syriacus*, Beirut, spp. nn. *Id. loc. cit.* pp. 103-107, pl. viii. figs. 1-3.

Idiops meadii, Source of Nile, *I. blackwallii*, Swan River, and *I. thorelli*, S. Africa, spp. nn. *Id. loc. cit.* pp. 152-156, pl. viii. figs. 4-6.

CECOBIIDES.

Eugène Simon (Mém. Liège, 1870, p.) rectifies an error with respect to the number of eyes of *Cecobius* (Lucas); these, given by Lucas (Expl. Alg.) as 6, are in reality 8; two small, triangular, or elongate, and having but little the appearance of eyes, overlooked hitherto by Lucas [and others]. *Conf.* Thorell, Europ. Spid. part i. p. 112.

Cecobius maculatus, sp. n., Spain. Simon, *l. c.* p. .

Simon also (*l. c.*) records and gives additional characters of *Cecobius domesticus* (Lucas) and *Cecobius annulipes* (*id.*) from Spain.

DYSDERIDES.

Dysdera tessellata, sp. n., Cantone Ticino. Canestrini and Pavesi, Arch. p. Zool. 1870, p. .

Dysdera cognata, sp. n., Bukowina, Galicia. L. Koch, JB. Ges. Krakau, xii. p. .

Segestria garbiglietti, sp. n., Liguria. Canestrini and Pavesi, *l. c.* pp. .

DRASSIDES.

Drassus decorus, sp. n., Lucca: Blackwall, P. L. S. x. p. 421.—*D. anglicus* (♂ new to science), England, = *Drassus lucifugus*, Blackw., non *Pythonissa lucifuga* (C. Koch) nec *D. lucifugus* (Walck.?). O. P. Cambridge, Tr. L. S. xxvii. p. 410, pl. 54. no. 12.

Drassus scintillans, sp. n., England. O. P. Cambridge, Tr. L. S. xxvii. p. 412, pl. 54. no. 12a.

Drassus pumilus (Blackw.) = *Melanophora electa* (C. Koch). *Id. l. c.* p. 413.

Agelena gracilipes (Blackw.) = *Leiocranum palliardii* (L. Koch). *Id. l. c.* p. 413.

Melanophora clivicola, Tatra, Nieszów (Galicia), Nürnberg, and Finsterthal; *M. latitans*, Rawa (Galicia), Nürnberg, and Jura (France), spp. nn. L. Koch, JB. Ges. Krakau, xli. 1870, pp.

Hecarge, Blackw. (*Zora*, C. Koch), *wrightii*, sp. n., Tuscany. Blackw. J. L. S. x. p. 407, pl. xv. fig. 2. [This genus, referred to the *Lycosides* by Mr. Blackwall, seems to be more properly included, as by L. Koch, N. Westring, and others, among the *Drassides*.]

Cheiracanthium, C. Koch. Characters of genus and an analytical table of species [too long for insertion at length, and not capable of satisfactory abridgment]. L. Koch, Abh. Ges. Nürn. 1864, pp. 137-139.

Cheiracanthium mildei, Meran and Dalmatia; *C. seidlitzii*, spp. nn., Rome. L. Koch, *l. c.* pp. 144, 158.

Clubiona diversa, Cambr., = *C. pallens*, C. Koch; *C. pallens*, Blackw., = *C. subtilis*, L. Koch; *C. assimilata*, Cambr., = *C. lutescens*, Westr.; *C. deinognatha*, Cambr., = *C. phragmitis*, C. Koch. O. P. Cambridge, *l. c.* pp. 413, 414.

Micaria aurata, *Drassus laticeps*, *Melanophora kochii*, *Cheiracanthium italicum* are figured. Canestrini e Pavesi, Arch. p. Zool. ser. 2. vol. ii. 1870, tav. iii. figs. 4, 5, 6, and tav. iv. figs. 3, 3a.

Stenochilus, nov. gen. (assigned doubtfully to the *Drassides*). *Cephalothorax* of somewhat attenuate diamond shape and strongly emarginate. *Eyes* 8, very unequal; in 2 transverse rows at fore extremity of caput, curved away from each other but forming a compact and almost circular group. *Masille* constricted at base, enlarged in circular form at the middle on outer sides, curved over and inclined towards the labium (over which their pointed extremities almost touch each other), and somewhat transversely impressed near the middle. *Labium* long, narrow, a little wider near the middle than at the base; apex sharp-pointed. *Legs* short, nearly equal; relative length 4, 1, 2, 3; tarsi terminate with 2 claws, minutely pectinated towards their bases, and springing from a kind of heel-joints. *Abdomen* narrow, elongate-oval. Spinners two only, short, strong, biarticulate.—*Stenochilus hobsonii*, sp. n., Bombay: O. P. Cambridge, P. Z. S. 1870, pp. 729-731.

DICTYNIDES.

Dictyna (Westr.) = *Dictyna* (Sundevall). T. Thorell, Syn. Europ. Spid. p. 210.

EUGÈNE SIMON (Mém. Liège, 1870, p.) proposes for the species of *Dictyna* three groups:—1. *Cephalothorax* short; caput convex and rounded; clypeus (bandeau) a little less in height than the ocular area. *D. hortensis*, Seville, Cordova; *D. bicolor*, Jeres and Tangier; *D. puella*, Corsica, spp. nn.: E. Simon, *l. c.* p. ; *D. variabilis* (C. Koch); *D. viridissima* (Walck.). 2. Caput very convex, long and narrow; clypeus vertical, as high as the ocular area. *D. globiceps*, sp. n., Pyrenees (Sim.), *l. c.* p. ; *D. latens*, (Fabr.); *D. benigna* (Walck.). 3. *Cephalothorax* narrow elongate; caput

less elevated than in the last group; clypeus much less in height than the ocular area. *D. præfixa*, Malaga; *D. monticola*, Pyrenees, spp. nn., Sim. l. c. p. .

PALPIMANIDES.

Palpimanus (Dufour). O. P. Cambridge, Ann. N. H. (4) 1870, p. 417, notices a hitherto unrecorded character of this genus, the possession of but two spinners.

AGELENIDES.

Storena formosa, New Holland, sp. n. T. Thorell, Öfv. Sv. Ak. 1870, p. 374.

Cydippe, g. n., O. P. Cambridge, P. Z. S. 1870, p. 731. Closely allied to *Lachesis*, Savigny, and *Storena*, Walck. *Cephalothorax* broadest behind; caput full and bluff before; clypeus of considerable height. *Eyes* 8, small, nearly of equal size; in three transverse lines (2, 2, 4) on fore slope of caput, forming roughly the letter T. *Legs* strong, relative length 4, 3, 1, 2; tarsi end with 3 claws. *Maxillæ* short, strong, greatly enlarged at base, curved and inclined towards *labium*, which is broader at the apex than at the base, and has its upper half nearly semicircular.—*C. unguiculata*, Natal, Afr., sp. n., Cambr. l. c. pp. 731, 732, pl. xlv. fig. 2.

Eugène Simon (R. Z. 1869, p.) characterizes *Lachesis*, Savigny, and *Enyo*, Sav., remarks upon their affinities, and forms a family (*Enydes*) of these and a third (gen. nov.), *Miltia*=*Enyo*, Savigny, ad part. *Lachesis reticulata*, sp. n., Spain: Simon, l. c. p. .

Miltia, g. n., Simon, R. Z. 1869, p. . *Cephalothorax* oval, much longer than broad, slightly constricted and truncate at extremities. Caput defined by slight indentations. *Eyes* rather unequal; the 4 foremost form a straight or slightly curved line; the centrals are round, wider apart, but not larger than the laterals, which are also round; those of the second row, placed immediately above the first, are larger, oval, and oblique; those of the third row inversely oblique, and convergent behind. *Falces* strong and divergent. *Maxillæ* straight, and not inclined towards the *labium*. *Legs* short, but proportioned as in *Enyo*, and totally destitute of bristles and spines.—Type *Miltia* (*Enyo*) *amaranthina*, Lucas, Algeria and Spain.

Cælotus bucculentus, Spain, *C. solitarius*, Tyrol, spp. nn.: L. Koch, Abh. Ges. Nürnberg. 1868, pp. 36-40, figs. 17, 18.—*C. pyrenaicus*, Pyrenees, Spanish frontier, sp. n.: Simon, Mém. Liège, 1870, p. .

Cybæus, g. n., = *Amaurobius*, Koch ad partem.—*Cephalothorax* (♂) as long as patella and tibia of leg of first pair, ♀ longer; ♂ as broad as (or ♀ broader than) tibia of fourth pair, slightly rounded on sides and narrowing moderately in front. Caput arched above and on sides; median indentation always present. *Eyes* of foremost row equally distant from each other and double of an eye's diameter from the edge of caput; centrals round, less in size than the laterals, which are oval; these, with the laterals of the hinder row, occupy a common elevation, but are somewhat separate from each other: hinder row curved upwards; the eyes equal, and equally separated, or, if any thing, the centrals more distant from each other than from the laterals. *Falces* prominent at base. *Maxillæ* curved, but

without impression. *Labium* nearly square, slightly and roundly truncate at apex. *Spinners* of superior pair 1-jointed. No calamistrum or scopula tarsi have a third claw; rel. length of legs 4, 1, 2, 3, or 1, 4, 2, 3. L. Koch, Abh. Ges. Nürnberg. 1868, p. 46. [Conf. Thorell, Europ. Spid. i. p. 127.] Type *Cybeus (Amaurobius) tetricus*, C. Koch, which is also described, and figures of ♂ and ♀ given, L. Koch, *l. c.* pp. 50, 51, figs. 24, 25.—*C. angustiarum*, Jura (France) and Galicia, sp. n., L. Koch, *l. c.* p. 47, figs. 22, 23.

Amaurobius jugorum, Tyrol; *A. pallidus*, Mehadia; *A. obustus*, Meran, spp. nn.: L. Koch, Abh. Ges. Nürnberg. 1868, pp. 24–31, figs. 11–14.—*A. crassipalpis*, Trentino and Canton Ticino, sp. n.: Canestrini and Pavesi, Arch. p. Zool. ser. 2. vol. ii. 1870, p. , tav. iv. figs. 2, 2a.

Eryo fusca, Spain; *E. stylifera*, Portugal; *E. affinis*, Spain; *E. isabellina*, Granada and Cadiz; *E. alacris*, Sierra Morena; *E. modesta*, Gibraltar; *E. maculata*, Tangier, spp. nn. E. Simon, R. Z. 1869, pp. .

Tegenaria inermis, Asturias (Spain); *T. nervosa*, Eastern Pyrenees; *T. subtilis*, Sierra Nevada; *T. testacea*, Granada; *T. picta*, Guadaramma; *T. minuta*, *ibid.*; *T. feminea*, Malaga; *T. patula*, Sierra Nevada; *T. cisticola*, Sierra Morena: spp. nn. E. Simon, Mém. Liège, 1870, pp. .

Agelena angustifrons, sp. n., Tangier, Granada: E. Simon, Mém. Liège, 1870, p. .—*A. (Agroeca) proxima*, sp. n., England: O. P. Cambridge, Tr. L. S. xxvii. p. 415, pl. 54. no. 13.

Miturga, g. n. *Cephalothorax* inverse ovatus valde altus supra undique convexus, impressionibus cephalicis nullis. *Oculi* 8, subæquales, in duas series parallelas subrectas vel paullo procurvas, non multo a margine clypei remotas dispositi. *Mandibulæ* fortes oblongo-ovatae, ungue mediocri curvato. *Maxillæ* parallelae ad basin subangustatae, in latere exteriori rotundatae. *Labium* late truncatum, maxillis duplo saltem brevius. *Pedes* prop. 4, 1, 2, 3, aculeati unguibus trinis. *Abdomen* longius ovatum, mamillæ 6, superiores longæ, reliquis duplo longiores, articulis binis subæqualibus, quorum 2^{da} subacuminatus est, et in apice et toto latere inferiore tubulis textoriis vestitus.—*Miturga lineata*, sp. n., N. Holland: T. Thorell, Cefv. Sv. Ak. 1870, pp. 375–378.

Thorell observes that *Miturga* must be referred to the *Agelenides*, though the form of the cephalothorax and tarsal claws bring it nearer to the *Lycosides*.

Textrix subfasciata, Spain; *T. variegata*, Gibraltar, spp. nn. E. Simon, Mém. Liège, 1870, pp. .

HERSILIDES.

Hersiliada, g. n., E. Simon, *l. c.* p. , = *Hersilia*, Savigny, ad part., and *Hersikola*, Thorell; differs from it in the undivided tarsi of the legs of the fourth pair, the greater proportional length of the legs of the third pair, and the comparative shortness of the spinners. Type *Hersikola oraniensis* (Lucas). [Conf. T. Thorell, European Spiders, part i. p. 115.]

SCYTODIDES.

Moneta, gen. nov. *Cephalothorax* rather elevated or gibbous at the thorax, lower and flattened before, of a short oval form, narrowest in front, with but very slight lateral compression at caput. *Abdomen* somewhat

quadrangular, broader behind than before, with a median cylindrical prolongation from its hinder extremity, terminating with the spinners. *Eyes* 8, rather unequal, in two nearly straight parallel rows, spanning the greater part of the width of the caput; clypeus flattened and prominent, exterior eyes on either side seated on a strongish tubercular elevation. *Maxillæ* rather long, strong, enlarged at their bases; curved and inclined over the *labium*, which is short and somewhat semicircular. *Sternum* rather long, kite-shaped, truncated at the sharp end. *Legs* long, slender, sparingly furnished with hairs and slender bristles; tarsi very short, ending with 3 claws; rel. length of legs, 1, 4, 2, 3.—*Moneta spinigera*, Ceylon, sp. n., O. P. Cambridge, P. Z. S. 1870, p. 736, pl. xlv. fig. 5, who assigns *Moneta*, together with *Scytodes*, Latr., and *Omosita* (Walck.), to *Theridides*, as a subfamily (*Scytodina*), Cambr. l. c. [On subsequent investigation their truer position seems to be that assigned here].

Theridides.

Theridion (*Theridium*) *concinnum*, *T. levigatum*, *T. convexum*, *T. prominens*, *T. delicatum*, Tuscany, spp. nn., J. Blackwall, P. L. S. pp. 424–428, pl. xvi. figs. 10, 11.—*T. parvulum*, sp. n., Sicily, id. Ann. N. H. (4) 1870, p. 400, pl. viii. fig. 5.—*T. mystaceum*, sp. n., Galicia: L. Koch, JB. Ges. Krakau, xli. p. —*T. instabile*, *T. familiare*, *T. blackwallii*, spp. nn., England: O. P. Cambridge, Tr. L. S. xxvii. pp. 416–419, pl. 55. nos. 14–16.—*T. stictum*, Cambr., England. *Male* described as new to science. *Id.* l. c. p. 412, pl. 55. no. 17.

Lathrodectus hasseltii, *L. scelio*, spp. nn., New Holland: T. Thorell, Cefv. Vet. Akad. 1870, pp. 369, 370.—*L. katipo*, sp. n., New Zealand, Ll. Powell, Tr. N. Z. Inst. iii. p. 57. See also two other communications (by F. W. Wright and W. Buller) “on the Katipo,” evidently referring to the same species, and chiefly to its poisonous qualities. [It is very nearly allied to, if not identical with, *L. scelio*, Thor. cit. *suprà*.]

Cephalobares, g. n. *Cephalothorax* short, nearly round at lower margins; caput large, abnormally elevated and convex, rounded on all sides, and projecting greatly over *falces*. *Eyes* not very unequal, in 4 pairs; two central pairs form a large square, whose fore side is shortest; on either side of the lower part of this square are the lateral pairs; the eyes of each of these are contiguous, on a very slight tubercle. *Legs* short, moderately strong, not greatly unequal in length; relatively 1, 4, 2, 3; tarsal claws 3, very minute. *Falces* small, moderately long, straight. *Maxillæ* moderate in length and strength, slightly inclined to *labium*, rounded off on their outer and pointed on their inner extremities. *Labium* very short, broad, and somewhat semicircular. *Abdomen* oval, cylindrical; its upper extremities behind projecting over the spinners.—*C. globiceps*, sp. n., Ceylon: O. P. Cambridge, P. Z. S. 1870, pp. 734–735, pl. xlv. fig. 4.

Erigone (*Neriene* ad part + *Walckenaera*), *E. avicula*, *E. anguinea*, *E. aurita*, *E. paradoxa*, *E. impudica*, *E. insecta*, *E. columbina*, *E. subelevata*, *E. erecta*, *E. gulosa*, *E. egena*, *E. helleri*, *E. remota*, *E. alpigena*, spp. nn., Tyrol: L. Koch, Z. Ferd. 1869, pp. 178–202.—*E. uncta*, sp. n., Galicia: id. JB. Ges. Krakau, 1870, p. —*E. (Neriene) pallipes*, *N. decora*, *N. mollis*, *N. excisa*, *N. arundineti*, *N. clarkii*, *N. neglecta*, *N. latebricola*, *N. fugax*, *N. incisa*,

N. formidabilis, *N. aspera*, *N. hispida*, *N. aperta*, spp. nn., England : O. P. Cambridge, Tr. L. S. xxvii. pp. 437-450, pls. 56, 57, nos. 29-34.—*Walckenaëra meadii*, *W. fortuita*, *W. scabrosa*, *W. dicros*, *W. permixta*, *W. implana*, *W. ignobilis*, *W. cirriferus*, *W. beckeri*, spp. nn., England : *Id.* l. c. pp. 453-460 pl. 57. nos. 36-44.

Sphecozone, g. n. *Cephalothorax* separated from abdomen by a distinct pedicle; caput rather elevated; clypeus impressed below the eyes. *Legs* long, slender, rel. length 4, 1, 2, 3,—4 and 1 nearly equal; tarsi end with 3 claws; palpi (♀) without terminal claws. *Eyes* not very unequal, situated in two transverse curved rows, or 4 pairs; those of each lateral pair contiguous and seated on a slight tubercle; those of the two central pairs form an oblong whose fore side is much shortest. *Maxillæ* moderately long, nearly straight, considerably inclined towards labium, dilated at bases, and somewhat pointed at extremities on inner side. *Labium* short, small, nearly semicircular.—*L. rubescens*, sp. n., Minas Geraes, Brazil : O. P. Cambridge, P. Z. S. 1870, p. 733, pl. xlv. fig. 3.

Linyphia punctata, sp. n., Tuscany : J. Blackwall, P. L. S. x. p. 429, pl. xvi. fig. 12.—*L. polita*, sp. n., Sicily : *id.* Ann. N. H. (4) v. p. 403, pl. viii. fig. 7.—*L. pallio*, sp. n., Krakau and Janów, Galicia : L. Koch, JB. Ges. Krakau, xli. p. —*L. albomaculata*, sp. n., Cantons Ticino, Trentino, and Emilia : G. Canestrini and P. Pavesi, Arch. p. Zool. ser. ii. vol. ii. 1870, p. —*L. impigra*, *L. circumcincta*, *L. approximata*, *L. furtiva*, *L. finitima*, *L. confusa*, *L. cingulipes*, *L. experta*, *L. longipes*, *L. inconspicua*, *L. oblita*, *L. microphthalmia*, *L. oblonga*, *L. pallida*, *L. decens*, spp. nn., England : O. P. Cambridge, Tr. L. S. xxvii. pp. 422-437, pl. 55. nos. 18-27.

*Ctenophora**, g. n. *Eyes* as in *Theridion*. *Falces* long, powerful, vertical, united at base; fang short and curved. *Maxillæ* slender, pointed at extremities, and strongly inclined towards the *labium*, which is semicircular. *Legs* very long, slender, relative length 1, 2, 4, 3,—1 and 2 greatly exceeding the rest. On the anterior side of the tibia and metatarsi of the 1st and 2nd pairs is a series of long, prominent, slightly curved spines, and in the intervals between these is a row of shorter spines, curved, and gradually increasing in length as they extend down the joints.—*C. monticola*, sp. n., Sicily, J. Blackwall, Ann. N. H. (4) v. p. 401, pl. viii. fig. 6.

Blackwall remarks (l. c. p. 402) that this genus and *Galena*, C. Koch, nearly allied, are closely related to the *Theridiides*, and should occupy a position intermediate between them and the *Epeirides*; but [which is not so obvious] Mr. Blackwall thinks that these two genera constitute a *family*, for which (l. c.) he proposes the name *Ctenophoridae*.

GASTERACANTHIDES.

Peltosoma, g. n. *P. ixioides*, Corsica, *P. tuberculiferum*, *ib.*, spp. nn., E. Simon, Mém. Liège, 1870, pp. . It is needless to give here Simon's characters of this genus, as he has lately expressed to the Recorder a well-founded opinion that it is identical with *Cyrtogaster*, Keyserling. The discovery of these spiders is remarkable, being the first of the genus recorded in Europe.

Gasteracanthia lepida, sp. n., Abyssinia. O. P. Cambridge, P. Z. S. 1870, p. 821, pl. l. fig. 2.

[* Preoccupied in Diptera.—Ed.]

EPEIRIDES.

Zilla alpina, sp. n., Galicia and Tyrol. L. Koch, JB. Ges. Krakau, xli. p. .
Epeira cancer, Hentz. The freshly hatched young differ greatly from the adult. A. S. Packard, jun., Am. Nat. iii. p. 616. [Rec. Am. Ent. 1870, p. 26.]

Epeira confinis, Sierra Nevada; *E. camelina*, Sierra Morenã; *E. agulenoidea*, Sierra Nevada; *E. illibata*, Malaga, spp. nn.: E. Simon, Mém. Liège, 1870, pp.

—*E. amena*, sp. n., Tuscany: J. Blackwall, J. L. S. x. p. 432, pl. xvi. fig. 13.—*E. thyridota*, sp. n., New Holland: T. Thorell, Öfv. Vet. Ak. 1870, no. 4, p. 367.—*E. carbonaria*, sp. n., Tyrol (closely allied to *E. ceropegia* (Walck.): L. Koch, Zeits. Ferd. 1869, p. 168, ♀, p. 206, ♂.—*E. alpica*, sp. n., Tyrol (closely allied to *E. cucurbitina*, Clerck): L. Koch, l. c. p. 173.

Chorizoopes, g. n. *Cephalothorax* short, nearly square, with the corners rounded off; caput inordinately large, very broad, much elevated, highest at occiput. *Abdomen* short, broad, nearly as high as long, largest behind, where it is bluff and has some small subconical eminences. *Eyes* 8, four in a small quadrangle in front of caput, and a pair on each side, far removed from the centrals, and close upon the lateral margins. *Legs* short, moderately strong; relative length 4, 1, 2, 3; tarsal claws 3, small, and with some supernumerary opposed and pectinated ones beneath. *Maxille* rather strong, greatly bent over the *labium*, which is somewhat triangular, broader in the middle than at the base, and pointed at the apex.—*C. frontalis*, sp. n., Ceylon: O. P. Cambridge, P. Z. S. 1870, pp. 737, 738, pl. xlv. fig. 6.

Eta, g. n. *Cephalothorax* rather depressed above and rounded on the outer margin; caput broad, flattened, and produced in front into three prominences, all in the same plane. *Eyes* 8 on these prominences, four on central, and two each on the lateral ones. *Abdomen* oval, pointed behind, not very convex above, armed on the upperside with tuberculiform spines, mostly surmounted with long and strongish bristles. *Legs* rather long, slender, and armed with long spine-like bristles; tarsal claws 3, with supernumerary opposed pectinated ones beneath; relative length 4, 1, 2, 3. *Maxille* strong, moderately long, inclined to the labium, obliquely truncate rather on their outer, and pointed on their inner extremities. *Labium* short, broad; apex curved. *E. spinosa*, sp. n., Ceylon: *Id.* l. c. p. 739, pl. xlv. fig. 7.

Tetragnatha pinicola, Galicia; *T. nowickii*, Galicia, spp. nn., Greece, Italy, South Tyrol and Nürnberg: L. Koch, JB. Ges. Krakau, 1870, pp. .
 A clear and useful differential analysis of the characters of the European species of *Tetragnatha*, too long to be inserted here, and too complete to be abridged, is added.

Argiope lordii, sp. n., Abyssinia: O. P. Cambridge, P. Z. S. 1870, p. 828, pl. i. fig. 1.

ULOBORIDES.

Mithras (Westr.) = *Hyptiotes* (Walck.), T. Thorell, Syn. Europ. Spid. no. 1, p. 43.—*Veleda*, Bl., = *Uloborus* (Walck.); *Veleda lineata*, Bl., = *Uloborus walckenaerius* (Dugès): O. P. Cambridge, Tr. L. S. xxvii. p. 415.

MIAGRAMMOPIDES.

Miagrammopes, g. n. *Cephalothorax* oblong, rather broader in front than behind; upper surface rather flat; fore corners of caput roundly truncate but no lateral compression. *Eyes* 4, in a single row across the caput. *L*

very unequal in length, extended straight fore and aft, peculiarly articulated on the lower surface of cephalothorax, without any sternal plate; relative length 1, 4, 2, 3; tarsi end with three strongly curved claws, each differently dentated; a strong calamistrum on the upper surface of the metatarsi of the fourth pair. *Palpi* short, ending with a strong curved black pectinate claw. *Falces* small and projecting. *Maxilla* long, tolerably strong, slightly inclined to labium, obliquely rounded at their outer extremities, where they are also a little enlarged. *Labium* elongate, pointed at apex. *Abdomen* long, narrow, enlarged towards the middle. Spinners 6, in three pairs, with an extra spinning-organ beneath; this last has no trace of being (as in some other spiders) formed by the union of two ordinary spinners. *M. thwaitesii*, *M. ferdinandi*, spp. nn., Ceylon: O. P. Cambridge, J. L. S. x. pp. 398-404, pl. xiv.

In the introductory remarks to the above, Cambridge observes that, while not then sufficiently assured upon the affinities of *Miagrammopes* to found a new family upon it, it was difficult to include it in any family hitherto characterized. [Subsequent investigation has suggested the necessity of founding the family *Miagrammopides* upon this most remarkable spider.]

STEPHANOPIDES.

Stephanopsis cambridgei, sp. n., New Holland: T. Thorell, Œfv. Vet. Akad. 1870, p. 378. Thorell includes *Stephanopsis* in the family *Thomisoidæ*, l. c. (see Eur. Spid. i. p. 170, note 2). [The spiders of this genus appear not to be *laterigrade*, with which Thorell agrees, "*pedes vix laterigradi*" (Œfv. Sv. Ak. 1870, p. 379). For this and other reasons it must at present form a family by itself.]

THOMISIDES.

Phycus, g. n. *Cephalothorax* small, broad-oval; caput large and elevated. Eyes 8, large, in two transverse curved rows, occupying the whole width of the upper fore part of caput, in form of a crescent, whose horns point backwards. *Abdomen* large, short, oval or heart-shaped, and projecting greatly over the base of the cephalothorax. *Legs* short, strong, armed with long slender spines and bristles; tarsi end with three claws. *Maxilla* moderately long, strong, rounded at extremities, a little curved, and greatly inclined over *labium*, which is small, subtriangular, with a slightly pointed apex.—*P. brevis*, sp. n., Ceylon: O. P. Cambridge, P. Z. S. 1870, pp. 742-744, pl. xlv. fig. 9. This genus is referred doubtfully to the Thomisides (*id. l. c.*) [from which it will probably have to be separated].

Thomisus amœnus, *T. exiguus*, *T. modestus*, *T. elegans*, spp. nn., Tuscany: J. Blackwall, J. L. S. x. pp. 415-419, pl. xvi. figs. 7-9.—*T. diversus*, sp. n., Sicily: *id.* Ann. N. H. (4) v. p. 396, pl. viii. fig. 3.—*T. (Xysticus) luctator*, Galicia; *T. (X.) striatipes*, Regensburg, Jura (France), and Galicia, spp. nn.: L. Koch, JB. Gesell. Krakau, 1870, p. —*T. brevicarsis*, *T. albinus*, *T. nigro-trivittatus*, *T. pauxillus*, *T. wagæ*, Spain: E. Simon, Mém. Liège, 1870, pp. —*T. westwoodii*, sp. n., England: O. P. Cambridge, Tr. L. S. xxvii. p. 403, pl. 54. no. 7 [this appears to be ♀ = *Xysticus ulmi* (Hahn), ♂ = *T. bivittatus* (Westring)]; *T. sanctuarius*, sp. n., England, *id. l. c.* p. 405, pl. 54. no. 8.—*T. cambridgei*, Blackw., the ♂ described as new,

id. l. c. p. 408, pl. 54. no. 9, *a, e, f, g*; *T. bifasciatus*, Blackw., palpi figured, *id. l. c.* pl. 54. no. 9, *b, c, d*; *T. pallidus*, Blackw., the ♂ described as new, *id. l. c.* p. 408, pl. 54. no. 10.

Monastes punctatissimus, sp. n., Spain: E. Simon, Mém. Liège, 1870, p. .

PHILODROMIDES.

Hemiclæa, g. n. Cephalothorax oblongus, inverse subovatus, valde depressus, fere planus, impressionibus cephalicis distinctis, clypeo humillimo, vix ullo. Sternum oblongum, ante coxas anticas in peltam quasi vel collare dimidiatum productum. *Oculi* 8, in duas series transversas parallelas appropinquantes ordinati; series postica longior. *Mandibule* breves, subporrectæ, ungue tenui. *Maxillæ* oblongæ, porrectæ, in medio lateris exterioris angustatæ; labium longum, angustum, subtriangulum; *pedes* prop. 4, 2, 1, 3, cum palpis extus subincrassatis lateraliter extensi. Genubus solo adpressis, tarsis brevissimis, trochanteribus pedum 4^a paris solito longioribus, unguis tarsorum bini, sat breves, fortiores. *Abdomen* longius, valde depressum; *mammillæ* longiores 6, superiores reliquis paullo longiores, ut inferiores articulis binis 2^{do} brevi. Allied both to *Selenops* (Dufour) and *Delena* (Walck.). *H. sundevallii*, sp. n., New Holland: T. Thorell, Öfv. Vet. Ak. 1870, p. 380.

Voconia, g. n. *Cephalothorax* æque circiter longus atque latus, deplanatus, clypeo humillimo. *Oculi* in series duas transversas, parallelas dispositi; series postica longior, antica recta vel paullo procurva; spatium inter oculos 4 anteriores, quorum laterales paullo majores sunt quam medii, oculi maximi diametrum non superat. *Mandibule* fortes ovatæ in dorso convexæ. *Maxillæ* oblongæ extus rotundatæ, in labium subsemicirculare, apice truncatum paullo inclinatæ. *Pedes* longi robusti, scopula densa et lata præditi; 4 posteriores vix graciliores sed breviores quam 4 anteriores, unguis 2 parvi, longi angusti, ad maximam partem subrecti, dentibus multis (saltem in ungue interiore) pectinati. *Abdomen* oblongus non valde depressum. [Evidently very nearly allied to *Delena*, Walck.] *V. insignis*, sp. n., New Holland: T. Thorell, Öfv. Vet. Ak. 1870, pp. 382, 383.

Heteropoda (*Olios*) *calligaster*, *H. pessleri*, spp. nn., New Holland: T. Thorell, *l. c.* pp. 385–387.

Sparassus, Westr., = *Micrommata*, Latr. Thorell, Syn. Europ. Spid. no. 2, p. 227.

Philodromus lepidus, sp. n., Sicily: J. Blackwall, Ann. N. H. 1870, p. 398, pl. viii. fig. 4.—*P. politus*, *P. catagraphus*, spp. nn., Spain: E. Simon, Mém. Liège, 1870, pp. ; *P. longipalpis*, sp. n., Pyrenees, *id. l. c.* p. ; *P. rubidus*, sp. n., Spain, *id. l. c.* p. ; *P. glaucinus*, sp. n., Sicily, Spain, and Corsica, *id. l. c.* p. ; *P. bistigma*, Andalusia and Sicily, *id. l. c.* p. —*P. prædatus*, sp. n., England: O. P. Cambridge, Tr. L. S. xxvii. p. 409, pl. 54. no. 11.

Thanatus vulgaris, sp. n., Spain, Sicily, Corsica, and Barbary, E. Simon, Mém. Liège, 1870, p. ; *T. lineatipes*, sp. n., Guadamarra, Spain, *id. l. c.* p. ; *T. major*, sp. n., Alps and Pyrenees, *id. l. c.* p. .

SPHASIDES.

Sphasus italicus, Blackw., ♂ described as new, Tuscany: J. Blackwall, J. L. S. x. p. 409; ♀ = *Sphasus gentilis*, Walck.: *id. l. c.*

LYCOSIDES.

Dolomedes ornatus, Blackw. Some particulars given not contained in the original description. Tuscany. J. Blackwall, J. L. S. x. p. 407.

Lycosa famelica, C. Koch. ♂ described as new, from Tuscany: J. Blackwall, J. L. S. p. 405. ♀, Greece, Sicily, Barbary, and Spain, = *L. vagabunda*, Lucas: E. Simon, Mém. Liège, 1870, p. . Simon also, *l. c.* pp. , describes several other recognized species of *Lycosa* (*Tarantula*): *L. (T.) hispanica*, Spain, sp. n., E. Simon, *l. c.* p. ; *L. (T.) leuckartii*, New Holland, sp. n., T. Thorell, Öfv. Sv. Ak. 1870, p. 388; *L. decipiens*, *L. albata*, Galicia, and *L. saltuaria*, Tyrol and Galicia; *L. prativaga*, Siebenbürgen, Galicia, and Tyrol; *L. ferruginea*, Galicia and Tyrol; *L. morosa*, Galicia, Bohemia, and Spain, spp. nn. L. Koch, JB. Ges. Krakau, xl. pp. — *L. albocincta*, sp. n., Sicily: J. Blackwall, Ann. N. H. (4) v. p. 394, pl. viii. fig. 1.—*L. congener*, *L. farreni*, *L. de greyi*, spp. nn., England: O. P. Cambridge, Tr. Linn. Soc. xxvii. pp. 393–397, pl. 54. nos. 1–3.—*L. nivalis*, Cambr., = *L. miniata*, C. Koch: *id. l. c.* p. 398.—*L. praelongipes*, Sinai, sp. n.: *id. P. Z. S.* 1870, p. 822, pl. 1. fig. 3.

SALTICIDES.

Salticus brevis, *S. exilis*, *S. blandus*, *S. intentus*, *S. obnixus*, spp. nn., Tuscany: J. Blackwall, P. L. S. x. pp. 410–415, pl. xv. figs. 3–6.—*S. petilus*, sp. n., Sicily: *id.* Ann. N. H. (4) v. p. 395, pl. viii. fig. 2.—*S. (Attus) dzieduszyckii*, sp. n., Galicia: L. Koch, JB. Gesellsch. Krakau, xli. p. —*S. (Callietherus) affinitatus*, *S. (Attus) aequipes*, *S. (Heliophanus) expers*, spp. nn., Britain; *S. floricola*, Blackw. (non C. Koch), named *S. saltator*; *S. scenicus*, Blackw., includes *S. histrionicus*, C. Koch; *S. sparsus*, Blackw., = *S. pratricula*, C. Koch, and *S. terebratus*, Cambr. O. P. Cambridge, Tr. L. S. xxvii. pp. 399–403, pl. 54. nos. 4–6.

MYRMECIDES.

Aphantochilus, g. n. *Cephalothorax* long, broader in front than behind, quasi-segmented by strong constrictions, and armed with some longish pointed projections; clypeus large, somewhat quadrate and prominent. *Abdomen* short, broad, oval, united to cephalothorax by a cylindrical pedicle. *Eyes* 8, small, unequal; in 2 quadrangular groups (of 4 each), widely separate from each other on the highest part of the caput. *Legs* moderate in length and strength; relative length 4, 1, 2, 3; tarsi end with 2 curved pectinated claws. *Maxille* long, straight, strong, very wide at their bases, contiguous on their inner edges near the extremities, which are a little enlarged, and rounded on their *outer*, and obliquely truncate on their *inner* sides. *Labium* obsolete. *Sternum* duplex, the fore one narrow, oblong-oval, deeply emarginate, and ending behind in a point between which and the coxæ of the fourth pair of legs is a second, very small, rudimentary sternal plate, round, and quite separate from the fore one. *A. rogersii*, sp. n., Minas Geraes, Brazil: O. P. Cambridge, P. Z. S. 1870, p. 744, pl. xlii. fig. 10.

Family — ?

Rhion, g. n. *Cephalothorax* short, rather flattened above, rounded on hinder margin, and a little compressed laterally at caput, which is broadish and truncate before. *Eyes* 6, rather large and not very unequal, four form a

nearly straight row across the upperside of the fore part of caput; and in front of each lateral eye is another nearly contiguous and distant about its own diameter's length from margin of clypeus. *Legs* neither very long nor strong; relative length 1, 2, 4, 3; metatarsi of 4th pair have calamistra on their outer sides; tarsi end with 3 curved pectinate claws. *Maxille* strong, rather long, curved and inclined towards labium, of nearly equal breadth throughout, and rounded at their extremities. *Labium* moderately long, broader at base than at apex, which is truncate. A supernumerary mamillary organ is situated beneath the usual spinners, which are 6 in number, rather strong, prominent and projected in the same plane as the abdomen.—*R. pallidum*, sp. n., Ceylon: O. P. Cambridge, P. Z. S. 1870, pp. 740–741, pl. xliv. fig. 8.

SCORPIONIDEA.

PSEUDOSCORPIONIDES.

The following genera and species are recognized by Dr. H. Hagen, P. Bost. Soc. xiii. 1870, pp. 263–272:—*BLOTHRUS*, Schiödte: *B. speleus*, Schiödte, Adelsberg Cave, Europe. *CHEIRIDIUM*, Menge: *C. hartmanni*, Menge, fossil amber; *C. muscorum*, Leach, Europe. *CHELIFER*, Geoffroy: *C. acaroides*, Latr., Europe; *C. americanus*, De Geer, Surinam; *C. berendtii*, Menge, fossil amber; *C. brachydactylus* and *C. bravaissii*, Lucas, Algeria; *C. brevimanus*, Kolenati, Caucasus; *C. cancroides*, L., Europ., N. Amer.; *C. corallifer*, Loew, Hungary; *C. corticalis*, Hahn, Europe; *C. depressus*, Koch, *ib.*; *C. ehrenbergii*, Koch and Berendt, foss. amb.; *C. geoffroyi*, Leach, Europe; *C. hemprichii*, Koch and B., foss. amb.; *C. inequalis*, Curtis, England; *C. kleemani*, Koch and B., foss. amb.; *C. muricatus*, Say, N. Amer.; *C. nepoides*, Herm., Europe; *C. pediculoides*, Luc., Algeria; *C. rhododactylus*, Menge, Danzig; *C. schaefferi*, Koch, Europe; *C. schrankii*, Koch, Europe; *C. sesamoides*, Savigny, Egypt; *C. sieboldii*, Menge, foss. amb.; *C. tuberculatus*, Luc., Algeria; *C. wrightii*, Hag., Cuba. *CHERNES*, Menge: *C. limicoides*, Menge, Danzig; *C. oblongus*, *id.*, *ib.*; *C. oblongus*, Say, N. Amer.; *C. sanborni*, Hag., *ib.*; *C. wigandi*, Menge, foss. amb. *CHTHONIUS*, Koch: *C. kochii*, Menge, foss. amb.; *C. maculatus*, *id.*, Danzig; *C. orthodactylus*, Leach, Europe; *C. pennsylvanicus*, Hag., Philad. *EUCARPUS*, Dalman, gum anime or copal. *MICROLABIS*, Corda: *M. sternbergii*, Corda, fossil, Bohemia. *OBISIUM*, Illiger: *O. beauvoisii*, Sav., Egypt; *O. brunneum*, Hag., N. Amer.; *O. corticale*, Hahn, Europe; *O. gracile*, Koch, *ib.*; *O. ischnochelus*, De Théis, *ib.*; *O. maritimum*, Leach, Europe; *O. pallipes*, Luc., Algeria; *O. pusio*, Kolen., Calcutta; *O. sieboldii*, Menge, foss. amb.; *O. sylvaticum*, Koch, Europe; *O. walckenaerii*, De Théis, Europe. *PELORUS*, Koch: *P. rufimanus*, Koch, Brazil. *PSEUDOSCORPIO*, Latr.

PHALANGIDEA.

OPILIONIDES.

L. KOCH, Z. Ferd. 1869, p. 150, gives the following analytical Table of genera:—

Tarsal portion of palpi without terminal claw.

Falces very elongate *Ischryopsalis*, C. Kochi.

Falces not very long *Nemastoma*, *id.*

Tarsal portion of palpi with terminal claw.

Terminal claw toothed.

Body without spines. *Leiobunum*, id.

Body with spines.

Body flat, first joint of falces concealed. . . *Homalenotus*, id.

Body arched, first joint of falces free . . *Hoplites*, g. n.

Terminal claw untoothed.

Femur, patella, tibia and metatarsus of fourth pair of legs longer than corresponding joints of the rest. *Egænus*, C. Koch.

Femur, patella, tibia, and metatarsus of second pair of legs longer than those of the other legs.

Body with spines. *Acantholophus*, C. Koch.

Body without spines.

Eye-emergence very large, broader than long.

Platylophus, C. Koch.

Eye-emergence of ordinary size.

Palpi of ♂ slender, long; falces elongated above in form of a horn *Cerastoma*, C. Koch.

Palpi of ♂ not strikingly long. No hornlike prominence on upperside of falces *Opilio*, Herbst.

Leiobunum bibrachiatum, *L. humile*, *L. glabrum*, spp. nn., Tyrol: L. Koch, l. c. pp. 151-154.

Hoplites, g. n. Abdomen arched and armed with a longitudinal row of spines; two projecting plates above the falces; eye-emergence armed with long spines; falces projecting freely beneath fore edge of cephalothorax; palpal claw distinctly dentate.—*Hoplites* (*Acantholophus*) *helleri*, Ausserer; *H. argentatus*, sp. n., Meran, Tyrol: L. Koch, l. c. p. 155.

Cerastoma tirolense, *C. capricorne*, Tyrol; *Opilio rhododendri*, Bavarian Alps; *Ischryopsalis manicata* and *Nemastoma daciscum*, Siebenbürgen; *N. superbum*, Naxos; *N. spinulosum*, Greece; *N. aurosum*, ib.: spp. nn., L. Koch, l. c. pp. 153-165.—*N. kochii*, sp. n., M. Nowicki, JB. Gesellsch. Krakau, 1870, p.

Homalenotus romanus, Rome; *H. hispanus*, Spain; *Platylophus montanus*, Erzgebirge; *Acantholophus obtusedentatus*, Modena, Andalusia: spp. nn., L. Koch, l. c. pp. 165-167.

ACARIDEA.

ACARIDES.

Tyroglyphus feculæ, found on potatoes, noted by M. Guérin-Ménéville in letter to French Academy.

Sarcoptes? An *Acarus*, in some respects agreeing with *Sarcoptes*, found in considerable numbers inside Pigeons by Mr. Charles Robertson of Oxford. Similar *Acar*i were also found by Col. Montagu in the Gannet, and since by Mr. Robertson in the Pelican. Am. Nat. iii. 1869, p. 389.

Dermaleichus rostratus, *D. landoisi*, *D. styliifer*, *D. ampelides*, *D. eulabis*, *D. limosæ*, *D. gallinulæ*, *D. elongatus*, *D. haliæti*, *D. attenuatus*, *D. glandarii*, *D. columbæ*, *D. puffini*, *D. aluconis*, *D. abbreviatus*, *D. pici-majoris*, *D. strigis-*

oti, *D. mucronatus*, *D. fuerstenbergii*, *D. stellaris*, *D. phaelonis*, spp. nn. R. Buckholz, Ver. L.-C. Ges. xxxv. 1870, pp. 1-56, pls. i.-vii.

IXODIDES.

Ixodes naponensis, Napo River; *I. albipictus*, Munson's Hill, Washington, D.C.; *I. nigrolineatus*, from *Cervus virginianus*, Northern New York; *I. unpunctata*, Mass.; *I. cookei*, from *Arctomys monax*, Salem; *I. leporis-palustris*, from *Lepus palustris*, Fort Macon, N.C.; *I. chordeilis*, from *Chordeiles popetue*, Mass.; *I. perpunctatus*, S. America? : spp. nn., A. S. Packard, jun., 1st Rep. Peab. Ac. 1869, pp. 65-69.

MYRIOPODA

BY

The Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S.

LIST OF PUBLICATIONS.

COPE, EDWARD D. Pr. Am. Phil. Soc. 1869, p. 179.

Records various new species found in Virginia; and characterizes a new family, *Andrognathidæ*, and two new genera, *Andrognathus* and *Pseudotremia*.

— On some new and little-known Myriopoda from the Southern Alleghanies. Tr. Am. Ent. Soc. iii. p. 65; Ann. N. H. (4) vi. pp. 425, 426.

Characterizes a new genus, *Petaserpes*.

NOWICKI, Dr. M. Beschreibung neuer Arthropoden. JB. Ges. Krakau, xli. p.

PORATH, C. O. v. Redogörelse för en under Sommaren 1868, utförd zoologisk resa till Skane Blekinge. Cefv. Vet. Ak. 1869, no. 6, pp. 631–650.

Records 39 species of various families and genera, 1 being described as new.

CHILOPODA.

LITHOBIIDÆ.

Lithobius gracilis, sp. n., C. O. v. Porath, Cefv. Vet. Ak. 1869, no. 6, p. 631.

CHILOGNATHA.

GLOMERIDÆ.

Glomeris mnischecki, sp. n., Tatragebirge, Galicia. M. Nowicki, JB. Ges. Krakau, xli. p.

LYSIOPETALIDÆ.

Pseudotremia, gen. nov. Annuli with two pores on each side of the median line.—*P. cavernarum* and *P. vudii*, spp. nn., Montgomery County, Virginia, U. S. A. E. Cope, P. Am. Phil. Soc. 1869, p. 179. (Cf. Ann. N. H. (4) vi. pp. 425, 426.)

IULIDÆ.

Spirobolus agilis, *Iulus montanus*, spp. nn., Montgomery County, Virginia. E. Cope, *l. c.*

Andrognathidæ, fam. nov., is a group intermediate between the suborders *Strongylia* and *Sugentia*. *Labium* a broad slightly cordate plate extending beneath the consolidated elements of the front, and having a slight membranous marginal attachment externally, leaving a small oval orifice at the anterior extremity. *Mandibles* rudimental, extremely minute, far within the margin of the inferior face of the head, composed apparently of two segments. *Segments of the body* consolidated; *præanal segment* an uninterrupted cylinder. E. Cope, Pr. Am. Phil. Soc. 1869, p. 179.

Andrognathus, g. n. *Joints of antennæ* 5, the 6th and 7th confluent and, with the closely joined 5th, forming a club. Supported by the short proximal joints. *Segments of the body* numerous (above 50 in the only species); *muzzle* short. Connects the suctorial and mandibulate groups of Myriopods.—*A. corticarius*, sp. n., Montgomery County, Virginia. E. Cope, *l. c.*

Petaserpes, g. n. *Head* concealed, to the bases of the antennæ, by the shield-like expansion of the scutum of the first annulus. *Ocelli* two, beneath the margin of the same and at the approximated bases of the antennæ; the latter large, stout, hairy, 6-jointed. Annuli without lateral processes, each with two pores forming two rows on each side of the body.—*P. rosalbus*, sp. n., East Tennessee. Allied to *Octoglena*, Wood. E. Cope, Tr. Am. Ent. Soc. iii. p. 365; Ann. N. H. (4) vi. pp. 425-426.

PAUROPODA.

Pauropus lubbockii, Salem, Mass., sp. n., A. S. Packard, Pr. Bost. Soc. xiii. p. 409; Am. Nat. iv. p. 621.

INSECTA.

THE GENERAL SUBJECT

By E. C. RYE.

BECKER, ALEX. Reise nach Derbent. Bull. Mosc. xlii. pp. 171-199.

Contains references to food-plants and habits of insects, p. 184, and Catalogues of the species of *Lepidoptera*, *Coleoptera*, *Hemiptera*, *Hymenoptera*, *Neuroptera*, and *Diptera* at pp. 193-197. A short list of Astracan *Coleoptera* observed since the publication of the author's former papers is given at pp. 198 & 199.

BRANDT, JOH. FRIEDR. Beiträge zur Naturgeschichte des Elens in Bezug auf seine morphologischen und palaeontologischen Verhältnisse, so wie seine geographische Verbreitung, nebst Bemerkungen über die Miocaena-Flora und Insectenfauna des Hochnordens. Mém. Pétersb. 7th ser. xvi. no. 5.

The author observes (pp. 81 & 82) that the insects of the Miocene of the extreme north belong to the same genera as those which now inhabit the North of Europe, Asia, and America (e. g. *Trogosita* and *Pentatoma*), or to genera and species resembling those of the present epoch, such as *Chrysomelites fabricii* and *Blattidium fragile*.

DOHRN, C. A. Ueber die Bedeutung der fundamentalen Entwicklungsvorgänge in der Insecten-Eiern für die Systematik der Insecten. S. E. Z. xxxi. pp. 214-250.

This appears to be the substance of a discourse delivered by Dr. Anton Dohrn at Innsbruck in 1869 on the bearing of the fundamental principles of the development of the ovum upon the classification of insects, especially testing Gerstäcker's system by the application of a scheme according to which all insects are divided into two sections:—one, *Ectoblasta*, in which the covering of embryonic cells becomes increased at one spot, and thence spreads over a large part of the circumference of the yolk, which becomes entirely surrounded by germinal shoots; the other, *Endoblasta*, in which the increase is directed inwards to the centre of the egg, so that the germinal shoots are surrounded by yolk.

DUNNING, J. W. Notes on a collection of Insects sent by Mr. Ansell from South-west Africa. Tr. E. Soc. 1870, pp. 521-532 (Dec.).

A list (with general observations) of 129 species of Insects

taken at Kinsembo, and distributed in their various orders as follows :—*Lepidoptera*, 51 genera, 82 spp. (viz. *Rhopalocera*, 30 genera, 59 species; *Heterocera*, 21 genera, 23 species); *Coleoptera*, 21 genera, 25 spp.; *Neuroptera*, 4 species, of as many genera; *Hymenoptera*, 3 genera, 5 spp.; *Diptera*, 2 species of different genera; *Hemiptera*, 11 species, of as many genera. In the *Rhopalocera*, by A. G. Butler, two new species are described; in the *Heterocera*, by F. Moore, indications of various new species are given; one new species is described and others are indicated in the *Coleoptera*, by H. W. Bates; indications of new species are given by R. M'Lachlan in the *Neuroptera*; F. Smith describes one new species in the *Hymenoptera*, and another in the *Diptera*; and J. Scott indicates new species in the Heteropterous *Hemiptera*.

GLOVER, TOWNEND. Practical Entomology for Farmers' Sons. (In Report of the Commissioner of Agriculture for the year 1868; Washington, Government Printing Office, 1869, pp. 305–318.)

Consists of instructions for collecting and preserving Insects, with a few outline cuts of apparatus &c.

GUENÉE, A. Rapport sur l'Excursion entomologique faite dans les Montagnes de l'Ardèche et en particulier à Celles-les-Bains de Mai à Juillet, 1869. Ann. Soc. Ent. Fr. 4^{me} sér. x. pp. 17–26.

Notices of captures of *Lepidoptera*, *Coleoptera*, and a few *Hymenoptera* &c.

HAGEN, HERMANN. Ueber rationelle Benennung des Geäders in den Flügeln der Insekten. S. e. Z. xxxi. pp. 316–320, Taf. iii.

The author briefly expounds his ideas of the fundamental scheme of neurulation in all Insects' wings, in the hopes of establishing uniformity of nomenclature. No explanation is given of the plate accompanying his paper.

HARDY, JAMES. On Turnip Insects during 1870. P. Berw. Nat. Club, vi. 1870, pp. 142–146.

An account of the ravages caused by *Aphides* &c. in the north of England.

HARDY, JAMES. Contributions to the Entomology of the Cheviot Hills. Ibid. pp. 160–172.

Consists chiefly of localities for *Coleoptera*.

JAKOWLEFF, W. Materialien zur entomologischen Fauna der Wolga-Gegend. Hor. Ent. Ross. vi. pp. 111–126.

Consists of:—1. A Supplement to the Catalogue of the *Hemiptera* of the Volga (3 new spp. described); 2. A Catalogue of the *Neuroptera* of the same district (1 new sp.).

KALTENBACH, J. H. Die deutschen Phytophagen aus der Klasse der Insekten. Verh. Ver. Rheinl. xxvi. pp. 106-224.

Continues the author's valuable work (from Jahrg. xxiv.), enumerating the various German insects that affect 59 genera of plants the names of which begin with the letter S, with notes of economy, bibliographical references, descriptions of larvæ, &c.

KESSLER, CH. Matériaux pour servir à l'étude de la faune du lac d'Onéga et du pays environnant. St. Petersburg: 4to, 144 pp., 8 plates, and map. (Supplement to Trav. de la prem. Assemb. des Nat. de Russ.)

This is the natural-history result of an excursion taken in 1866 by the author, who appears to have chiefly turned his attention to the *Crustacea*. Observations are contained in it on the geographical distribution of *Acanthia lectularia*, *Pulex irritans*, *Blatta germanica*, and *Periplaneta orientalis* (a quartette suggestive of comfort to the traveller!), and *Myrmeleon formicarius*, and especially on the number of *Phryganidæ*. It also contains a catalogue of *Lepidoptera* taken near Petrosavodsk.

KRAATZ, G. Ueber das älteste der Merian'schen Werke. B. c. Z. xiv. pp. 91-96.

Entirely bibliographical [*cf.* Snellen, Nouv. et faits div. no. 14].

MEYER-DÜR, L. R. Entomologische Parallelen zwischen den Faunen von Central-Europa und der süd-amerikanischen Provinz Buenos Ayres. Mitth. schw. ent. Ges. iii. pp. 175-178.

This grandiose title is scarcely warranted by the two small pages of trivialities to which it is prefixed; and the sole semblance of excuse for it is the author's description of two new species of *Nabis* (*Hemipt.*), which he considers allied to the European *N. ferus*.

MÜLLER, H. Ueber die Anwendung der Darwin'schen Theorie auf Blumen und blumen-besuchende Insekten. Verh. Ver. Rheinl. xxvi. Corr.-Bl. pp. 43-66.

Especially refers to the fertilization of plants by *Hymenoptera* and *Diptera*. [*Cf.* Delpino, Bull. Ent. Ital. ii. pp. 140-159, 228-241, Tav. i.]

NEWMAN, EDWARD. The Insect Hunter's Year-book for 1869. London, 1870, pp. 20.

From this pamphlet it would appear that British entomologists have, since the publication of the Year-book for 1868, discovered only 15 species new to their fauna in all orders.

NICHOLSON, HENRY ALLEYNE. Insecta. Chap. xxxix. pp. 208-226, of 'A Manual of Zoology for the use of Students, with a general Introduction on the Principles of Zoology,' vol. i. Invertebrate Animals. Hardwicke, 1870.

The author briefly discusses the *Insecta*, adopting Huxley's

views. He divides the class into three subclasses: I. AMETABOLA (*Anoplura*, *Mallophaga*, *Thysanura*); II. HEMIMETABOLA (*Hemiptera*, including *Homoptera* and *Heteroptera*; *Orthoptera* and *Neuroptera*); III. HOLOMETABOLA (*Aphaniptera*, *Diptera*, *Lepidoptera*, *Hymenoptera*, *Strepsiptera*, *Coleoptera*). A few borrowed woodcuts are given.

PACKARD, JR., A. S. On Insects inhabiting Salt Water. Comm. Ess. Inst. vi. pp. 41-51, figs. 6. [Internal sheet-date is March 1869; external dates of vol. vi. part i. are 1868 in middle, and March 1870 at bottom.]

The author notes two instances of *Diptera* and one of *Coleoptera* occurring in brine or salt water, and recorded by American naturalists; and gives a list (from Hagen) of papers by European authors on the same subject. He then describes and figures with details two new species of *Diptera* of saline habits from America, and indicates the existence of other species of that order of similar economy.

PERRIS, ÉDOUARD. Exploration des nids d'Hirondelles. Ann. Soc. Ent. Fr. (4) ix. p. 468.

From the author's observations, larvæ of *Lucilia dispar* are to be found in swallows' nests in the spring, and in autumn and winter pupæ of *Ornithomyia avicularia* and *Stenopteryx hirundinis*, and larvæ of *Attagenus piceus* and *Anthrenus pimpinella*. Dipterous pupæ also occur in larks' nests.

RONDANI, CAMILLO. Nota sugli Insetti parassiti della Galleruca dell' Olmo. Parma: August, 1870. 1 plate.

Treats of three known parasites of *Galleruca xanthomelæna* (*calmariensis*):—1, a Dipteran; 2, a *microscopic* Hymenopterous ("Vespa"); and, 3, one of the *Braconides* or *Ichneumonides*, named provisionally (not described in any way) *Ichneumon gallerucarum*; also of two other species, similarly parasitic, one a Dipteran already described by R. Desvoidy, the other ascribed to *Pteromalus* by Fonscolombe, under the name *galleruca*, but for which the author creates a new genus.

SIEBKE, H. Om en i Sommern 1869 foretagen entomologisk Reise gjennem Ringerike, Hallingdal og Valdres. Christiania: 1870, pp. 71.

An account of insects of all orders met with by the author in the above-mentioned localities. One or two new species are described.

WATTENWYL, BRUNNER VON. Ueber den Werth der Species und der Cataloge des British Museum. Verh. z.-b. Wien, Bd. xx. pp. 161-166.

Contains strictures upon the 'Catalogues' published by the British Museum (especially referring to the *Blattariæ*), which are alleged to be improperly ante-dated, to be without a system,

and to contain a number of valueless names (explained by the author's statement that these catalogues are paid for according to the number of new species established in them).

WEYENBERG, —. Insectes fossiles du calcaire lithographique de la Bavière [from Arch. Musée Teyler, t. 2]. 1870, 4to, 4 plates.

WHITE, F. BUCHANAN. Notes on the Insects of Strathglass, Inverness-shire. Ent. M. M. vii. pp. 45-53.

Contains observations on the Scotch mountain Insect-fauna, and an account of the rarer species of *Lepidoptera*, *Coleoptera*, *Hemiptera*, and *Neuroptera* observed in Strathglass by the author.

Mr. STANTON's 'Entomologist's Annual' for 1871 (8vo, London: 1870, pp. 116, 1 pl.) contains:—An account of the results of a second Entomological visit to the Engadine, by the Editor; stray notes on Swiss *Trichoptera*, by M'Lachlan; notices of new British species of *Coleoptera* (about 40 in number, including 10 species and one genus new to science), by the Recorder; notes on various species of *Apidæ*, *Formicidæ*, *Fossoræ*, and *Vespidæ*, with observations on some of the parasites of the latter, by Smith; notes on new and rare British Macro-Lepidoptera (11 in number, including 3 new to science), by Knaggs; an account of 4 new British species of *Tineina*, by the Editor; notes on Sericulture, by Wallace; and a summary of the species of *Lepidoptera* first observed in Britain since 1853, by the Editor.

DELPINO (Bull. Ent. Ital. ii. pp. 140-159, 228-241) translates and comments upon Müller's discourse (Verh. Ver. Rheinl. 1869) on the application of the Darwinian theory to flowers and to insects frequenting them. He gives (tav. i. figs. 1, 2, 4, 5, 6, 7, 9, 10, 11, 12, 13) highly magnified drawings of scales from different parts of a *Culex*.

OGLE (Pop. Sc. Rev. ix. pp. 45-50, 160-172, pls. lvi. & lix.) discusses the means employed by insects in fertilizing certain plants.

WALSH & RILEY (Amer. Ent. i. pp. 101-110; ii. pp. 45-50, 70-74, 103-106), under the heading "Galls and their Architects," give particulars of the economy and excellent figures of American gall-producing insects of various orders (chiefly *Hymenoptera* and *Diptera*) and of their galls. Some new species and a new genus are described.

MÜLLER (Pr. E. Soc. 1870, p. ix) describes Indian galls on a sp. of *Gnetum*, and galls on *Ammophila arundinacea* from Aberdeen.

RTCHIE (Canad. Nat. v. pp. 61-66) discusses various reasons for insects flying to light—without, however, adding any thing of importance to the knowledge of the subject.

LABOULBÈNE refers to a chicken's egg, on the outside of which were small rugosities, considered probably to be the ova of an insect (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xii).

LARTIGUE (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xxxviii) speculates on tracks made by insects on paper.

LE BARON (Amer. Ent. & Bot. ii. pp. 232-234) briefly discusses noxious larvæ.

For a detailed account of the economy &c. of insects of various orders injurious to the grape-vine in N. America, cf. Amer. Ent. ii. pp. 22, 54, 89, 123, 150, 173, 208, 234, 272, 295, 327, 353.

TARGIONI-TOZZETTI (Bull. Ent. Ital. ii. pp. 206-208) makes some observations on insects injurious to the vine &c.

For detailed accounts of insects injurious to the potato in N. America, and their parasites, see Amer. Ent. i. pp. 21, 41, & 250.

SAUNDERS (Canad. Ent. ii. pp. 111-113, 126-129, 146-149), under the head "Entomological Gleanings," discusses the habits of certain N. American spp. injurious to vegetation.

Observations on the more noxious effects caused by insects imported into America from Europe than by allied indigenous spp. are recorded in Amer. Ent. ii. p. 110, by Riley.

A discussion on injuries caused to mankind by certain *Hymenoptera* and *Diptera* is reported in Bull. Horæ Ent. Ross. vii. pp. v-xi.

PETTIGREW (C. R. lxx. p. 875) claims the publication in P. R. Inst. 1867 by himself of certain discoveries with regard to the flight of insects subsequently brought forward by Marey. MAREY (ibid. p. 1093) admits Pettigrew's priority.

LANDOIS (Verh. Ver. Rheinl. xxvi. pp. 67-70) discusses various instances of sounds emitted by insects.

LICHTENSTEIN (Pet. Nouv. 17. p. 65) suggests a trinomial scheme of scientific nomenclature, wishing the *old* name of the genus to be retained, as well as the modern. Ragonot, ibid. 18. p. 70, urges objections to this, and would prefer to use as a generic name an equivalent for the 'subdivision' in which any species is placed—e. g. '*Carabus*' *spinibarbis* for *Leistus*, *Leistus* being in the *Carabidæ*.

For observations on practice in nomenclature, arising on the point of the Brenthid generic name *Diurus* (Dej. Cat. 1834), published by Pascoe in 1862, being interfered with by Gemminger & v. Harold's alteration in 1869 of the Telephorid *Biurus* (Motsch. 1852) into *Diurus*, cf. Pr. E. Soc. 1870, pp. v-viii.

In Abh. Ver. Brem. Bd. ii. Hft. 2, pp. 275-296, in a paper by Hápke, "Die volksthümlichen Thiernamen im nordwestlichen Deutschland," are many local names of insects.

SANBORN (Amer. Ent. & Bot. ii. pp. 166, 199, 236, 266, 294) gives instructions for the collection and study of insects.

DOUGLAS (Ent. M. M. vii. p. 43) remarks upon the nomenclature of wing-nerve, and on the importance of the abdominal appendages in specific determination.

CROWFOOT (Tr. Norw. Soc. 1869-70) remarks generally upon the study of Entomology.

NAACKE (JB. schles. Ges. xlvii. pp. 185-188) gives an outline of Entomological Literature to 1862.

Means for protecting collections of insects from damage are discussed in Pet. Nouv. no. 15. p. 53, no. 16. p. 63.

Remarks by Horton on the Entomology of the Malvern district, with lists of species, of which the *Lepidoptera* only are worth attention, occur in Trans. Malv. Nat. Cl. 1870, pp. 167-188.

DOUGLAS (Ent. M. M. vii. p. 137) records insects of various orders taken at Deal.

In the protocol of 47th meeting of Soc. Imp. des Amat. des Sc. Nat. d'Anthrop. et d'Ethnogr. held at Moscow 29th January 1870, is an account (amongst other things) of the insects collected by Fedtschenko during an expedition to the valley of Zaravschan. 59 species of *Dolichopidae* (Dipt.) are recorded, of which 28 are new, almost all being named, but not described. Oschanin names 109 spp. of the *Hemiptera*, of which 16 are new; these are named and described (with Latin diagnoses). One new genus and seven new species of *Tenthredinidae* are also characterized by Mme. Freymuth.

A collection of short descriptions of species of *Coleoptera*, *Diptera*, *Lepidoptera*, and *Arachnida* described recently as new, from Italy, is contained in Bull. Ent. Ital. ii. pp. 56-67.

A few general remarks on the Entomology of Japan are made in Mém. Soc. Cherb. 2nd ser. iv. pp. 90 & 91, and on the *Insecta* of New Zealand, pp. 314 & 315, by Jouan.

In "Notes on the Fauna of Tasmania," by Krefft, published in P. R. Soc. Tasm., are some curt indications of the *Insecta* of that country, pp. 103 & 104.

Some notes on the insects of Round Island are published by Pike in P. R. Soc. Maur. iv. p. 131 *et seq.*

MULSANT, in his 'Souvenirs du Mont Pilat,' gives some entomological details, with a Catalogue of the more remarkable *Coleoptera* and *Lepidoptera* found on that mountain.

Lists of species taken at Molencate (including some new to the Dutch fauna) are given by v. Hasselt, v. Vollenhoven, Ritsema, and De Man in Tijdschr. Ent. 2nd ser. Deel v. pp. 30-34.

KIRBY (J. R. Dubl. Soc. 1870, pp. 436-444) gives an account of insects collected by him in Italy and Switzerland, and at Hilden, near Düsseldorf (the *Lepidoptera* only being of any interest).

LABOULBÈNE specifies *Coleoptera* and *Hymenoptera* from Cannes (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xxxiv).

COLEOPTERA

By E. C. RYE.

LIST OF PUBLICATIONS.

ABEILLE DE PERRIN, ELZÉAR. Nouveaux Coléoptères français. Ann. Soc. Ent. (4) x. pp. 79-90.

Contains descriptions at full length of 6 species, of which the diagnoses were published in Pet. Nouv. 1 Dec. 1869 (Zool. Rec. vi.), and of one other sp., for which the author erroneously claims a date in that year.

ALLARD, ERNEST. Révision des Curculionides Byrsopsides. B. E. Z. xiv. 1870 (Beiheft), pp. 185-206, Taf. i.

Although not so indicated by the above title, this work is confined to the two genera *Rhytirhinus* and *Gronops*, representing 1870. [VOL. VII.]

the *Byrsopsides* in Europe. Of the former genus 23 species are enumerated (the plate giving outline figures of the bodies of 20 of them), and of the latter 8, one being considered as new.

ALLARD, ERNEST. Révision du genre *Sphenophorus*. *L. c.* pp. 207-210.

The author enumerates 7 (European) species of this genus, and describes one as new.

——. [See VON HEYDEN.]

ANCEY, FÉLIX. Coléoptères nouveaux. *L'Ab.* vii. pp. 84-88.

Contains descriptions of a new genus and species of *Lathridiidae*, 2 new spp. of *Lampyris*, and notes on *Agrius 6-guttatus*.

BALLION, E. Bemerkungen über einige Käfer-Arten des Catalogus Coleopterorum von Dr. Gemminger und B. von Harold. *Bull. Mosc.* xlii. pp. 210-220.

Instances of species of various genera of the *Geodephaga* that require re-naming on account of *double emploi* are given at pp. 217-219.

BARGAGLI, PIERO. Escursioni Entomologiche sulla Montagna di Cetona. *Bull. Ent. Ital.* ii. pp. 169-176.

Relates exclusively to *Coleoptera*, containing a list of the more important species observed, with indications of new spp., and description of one new sp. of *Adelops*.

——. Materiali per la Fauna Entomologica dell' Isola di Sardegna. *Ibid.* pp. 262-279.

After some introductory remarks on the localities and botany of Sardinia, the author commences a Catalogue of the *Coleoptera* observed in that island, of which he completes the *Carabidae*.

BATES, F. Descriptions of new genera and species of *Heteromera*. *Ent. M. M.* vi. pp. 268-275, pl. ii. figs. 1-4.

Contains characters of two new genera and one new sp. of *Tenebrionides*, and two new genera and seven new spp. of *Cnodalonides*, chiefly from Nicaragua.

BATES, H. W. On a new genus and some new species of *Copridae* (Coleoptera Lamellicornia). *Tr. E. Soc.* 1870, pp. 173-180 (June).

——. Contributions to an Insect Fauna of the Amazon Valley (Coleoptera, Cerambycidae). *Ibid.* pp. 243-335 (August), pp. 391-444 (Dec.).

——. On a new genus and species of *Carabidae* allied to *Carabus* proper. *Ent. M. M.* vii. pp. 32, 33.

The insect is from Pekin, and close to *Damaster*.

BAUDI, FLAMINIO. Coleopterorum messis in insula Cipro et Asia minore ab Eugenio Truqui congregatae recensitio: de

Europæis notis quibusdam additis (Pars tertia). B. E. Z. xiv. pp. 49-90.

The author continues his remarks upon *Coleoptera* from the above specified localities (*Phalacridæ*—*Eucnemidæ*): he characterizes one new genus and describes 30 new species, those in the notes being from Piedmont and Sardinia.

BEDÉL, LOUIS. Description de nouveaux *Stenus* et *Callidium* Français. L'Ab. vii. pp. 91-96.

BELL, — VON. Verzeichniss der bis jetzt in der Umgegend von Jaroslav aufgefundenen Käfer. Bull. Mosc. xlii. pp. 143-170.

505 species, belonging to 224 genera, are enumerated in this Catalogue, with notes on size, time of appearance, and degree of rarity, and occasional observations on varieties and habits.

BELLEVOYE, A. Observations sur les mœurs de plusieurs espèces de Coléoptères qui vivent sur les plantes aquatiques. Bull. Soc. Moselle, 1870, pp. 30, 2 pl.

Has especial reference to the habits of *Hæmonia*.

BERTOLONI, GIUSEPPE. Descrizione di Coleotteri novelli Mosambicesi. Mem. Ac. Bologn. (2) viii. pp. 191-203, tav. i.

Three new species of *Gallerucidæ* are described and figured. The author adduces arguments in favour of his *Ranzania splendens* (*Lamellic.*), sunk as a synonym of *Rhamphorrhina petersiana* (Kl.).

BISCHOFF-EHINGER, — (& STIERLIN, GUSTAV). Reise in die italienischen Hochgebirge des Piemonts. Mitth. schw. ent. Ges. iii. pp. 159-175.

Contains an account of an expedition in the Piedmontese Alps, with notices of a few *Coleoptera*. At the end is a list (by Stierlin) of all the *Coleoptera* observed.

BRISOUT DE BARNEVILLE, CHARLES. [See VON HEYDEN.]

BRISOUT DE BARNEVILLE, HENRI. Monographie des espèces Européennes et Algériennes du genre *Baridius*. 1^e partie, Ann. Soc. Ent. Fr. (4) x. pp. 31-66; 2^e partie, *ibid.* pp. 287-296.

In the above-mentioned pages (all that have come to the Recorder's hands for the year 1870) 31 spp. are described, of which 8 are treated as new. The tabular arrangement enumerates 48 spp. in all, of which 9 appear to be new. Copious generic characters are given, with an account of the larvæ of such spp. as are known.

BURMEISTER, H. Cassidina Argentina. Anmerkungen zu Boheman's Monographia Cassididarum, die Arten des La Plata-Gebietes betreffen. S. E. Z. xxxi. pp. 272-281.

Six new spp. are described.

CHAPMAN, T. ALGERNON. On the habits of *Platypus cylindrus*, Fab. Ent. M. M. vii. pp. 103–106, 132–135.

The author supplements the accounts of this species given by Ratzeburg and Perris by fully describing its habits.

——. On the parasitism of *Rhipiphorus paradoxus*. Ann. N. H. (4) v. pp. 191–198.

——. Some facts towards a life-history of *Rhipiphorus paradoxus*. L. c. vi. pp. 314–326, pl. xvi.

CHAUDOIR, BARON MAXIMILIEN DE. Essai monographique sur le genre *Abacetus*, Dejean. Bull. Mosc. xlii. pp. 355–410.

Also describes spp. of *Chlæminus* (Mots.), and characterizes a new allied genus. 40 new spp. are described in all.

——. Monographie des Graphiptérides. Ibid. xliii. pp. 284–340.

CHEVOLAT, AUG. Coléoptères de l'Île de Cuba. (Suite: 1.) Notes, Synonymies et Descriptions d'espèces nouvelles. Huitième mémoire. Famille des Dasyllides et Malacodermes. Ann. Soc. Ent. Fr. (4) x. pp. 67–78. [7^e mém. l. c. 1867.]

Describes 25 spp. of Cuban *Dasyllidæ* and *Lycides*, of which 17 are treated as new.

CROTCH, G. R. The genera of Coleoptera studied chronologically. Tr. E. Soc. 1870, pp. 41–52 (1735–1801), pp. 213–241 (1802–21).

The author considers that a genus consists of but one species necessarily, viz. its type; and is therefore not defined by variable characters, but by knowledge of type species; hence, that genera proposed in catalogues on previously described spp. are entitled to priority. He points out many errors in dates. The present portions conclude with the genera of Dejean and his contemporaries, and the author hopes in a third part to carry the work down to the commencement of the 'Berichte' in 1836.

The first part of Crotch's paper is translated into German by v. Harold, and appears in C. H. vi. pp. 70–83.

——. Notes on British Coleoptera. Ent. 73, pp. 7–11.

Notes (compiled from Bedel's monograph) on the British spp. of *Triplax*, and extracts from Des Loges's monograph of *Rhynchites*.

CZWALINA, G. Drei neue deutsche Arten der Staphylinen-Gattung *Oxytelus*. B. E. Z. xiv. pp. 419–423.

DESBROCHERS DES LOGES, J. Description d'Apionides et de quelques autres espèces de Curculionides nouveaux. Mitth. schw. ent. Ges. iii. pp. 179–205.

Contains descriptions of 33 new spp. of the genera *Apion*,

Anthonomus, *Lixus*, *Larinus*, *Pissodes*, *Erirhinus*, and *Sitones*, from Europe (in the widest signification of that continent), and re-descriptions of 2 spp. already published by the author in Deyrolle's *Pet. nouv. Entom.*

DESBROCHERS DES LOGES, J. Monographie des *Magdalinus* d'Europe et des pays circum-méditerranéens. *L'Ab.* vii. 1870, April, pp. 1-32; May, pp. 33-64.

23 spp. are described, of which 5 are treated as new; and some synonymic points are cleared up. At pp. 60 & 61 are some additions to and corrections of the author's monograph of the *Rhinomacerides*.

—. Descriptions de Coléoptères nouveaux d'Europe et confins. *Ibid.* pp. 97-135.

37 species are described in this paper, of which 16 are new, diagnoses of the rest having already been published in *Pet. nouv.* 1869. Von Harold adopts March 1870, the date of publication of *L'Ab.* vii., for these species.

—. [See VON HEYDEN.]

DIECK, G. Eine entomologische Wintercampagne in Spanien. *B. E. Z.* xiv. pp. 145-184.

Treats exclusively of *Coleoptera*. The new species indicated in this paper are described in the 'Beiheft' of the same publication for 1870.

—. Ein entomologischer Ausflug in die Berge Süd-Corsica's. *Ibid.* pp. 397-404.

Relates exclusively to *Coleoptera*.

—. [See VON HEYDEN.]

FAIRMAIRE, LÉON. Faune élémentaire des Coléoptères de France. 1870, 12mo, 6 pls., containing 70 principal types.

FAUVEL, ALBERT. Décades synonymiques. *L'Ab.* vii. p. 136. Ten synonymic observations on *Brachelytra*.

FINKH, —. Ueber das Vorkommen der Canthariden in Württemberg. *Württ. JH.* xxvi. pp. 364-367.

FRAUENFELD, GEORG VON. Ueber Vertilgung des Rapskäfers. *Verh. z.-b. Ges. Wien*, 1870, xx. pp. 235, 236.

Consists of observations on the destruction caused to *Cruciferae* by *Meligethes aeneus*.

FREY-GESSNER, E. Sustenpass und Sedrun für *Nebria escheri*, H., und *bremii*, H. *Mith. schw. ent. Ges.* iii. pp. 210-214.

Chiefly an account of alpine localities for these 2 spp.

REY-GESSNER, E. *Leistus montanus*, Steph. (*fulvibarbis*, Hffag., Heer). Ibid. p. 215.

An account of the habits in the Jura of this rare sp.

FRIVALDSKY, JANOS. A Magyarországi Téhelyröpüek (Coleoptera) műszavainak Magyarázata rövid boncz-s élettani ismertetéssel: in the "Mathematikai és Természettudományi Közlemények. Vonatkozólag a hazai Viszonyokra. Kiadja a Magyar Tudományos Akadémia matematikai és természettudományi allandó bizottsága." Pest. v. 1867, pp. 1-98, Tábla i.-iii.

An explanation of the technical terms of the *Coleoptera* of Hungary, with a short account of their anatomy and physiology. The plates relate solely to external anatomy. Tables are given of the orders of the *Insecta*, at p. 73, and of families of the *Coleoptera*, pp. 74-82. A glossary of terminology is given in Hungarian, Latin, and German, pp. 87-98.

GAUTIER DES COTTES, C. Nouvelles entomologiques, ou recueil synonymique de descriptions d'espèces et genres nouveaux; monographique, de mœurs et remarques sur des insectes coléoptères de la faune européenne et méditerranéenne. Suite. Mitth. schw. ent. Ges. iii. pp. 257-264, 297-305.

This exhaustive title represents a short paper (disfigured by typographical and other errors), containing descriptions of 7 new spp. of *Carabidæ* (one of which has been already published by the author in Pet. Nouv., cf. Zool. Rec. vi. p. 198) and of 2 *Longicornia*, accompanied by synonymical remarks upon the 4-spotted group of *Tachys*, and a continuation of the author's work on *Feronia*, in which he redescribes 9 spp. of the subgenus *Orthomus*.

The paper now under notice is intended to supplement former articles by the author in R. Z. May 1866.

GEMMINGER, MAX, & HAROLD, E. VON. Catalogus Coleopterorum hucusque descriptorum synonymicus et systematicus. Tom. vii. 8vo. Munich: 1870.

The above-mentioned vol. comprises the *Tenebrionidæ*, *Nilionidæ*, *Pythidæ*, *Melandryidæ*, *Lagriidæ*, *Pedilidæ*, *Anthicidæ*, *Pyrochroidæ*, *Mordellidæ*, *Rhipidophoridæ*, *Cantharidæ*, and *Edemeridæ*.

In C. H. vi. will be found corrections and additions to vols. i., ii., iii., and vi. of this work, by Crotch (many of which have already been recorded elsewhere), pp. 94-102; to vols. i.-v., by von Harold, pp. 102-110; to vols. vi. and vii., by Gemminger pp. 110, 111.

Alterations in generic and specific names, from p. 1633 to p. 2176, are explained by Gemminger, C. H. vi. pp. 119-124.

Such of these alterations &c. as appear worthy of extracti-

will be found in their proper places in this Record; the rest, chiefly of mere bibliographical interest, would occupy too much space.

[For remarks upon the earlier part of this Cat., cf. Ballion, Bull. Mosc. xlii. pp. 210-220.]

GLOVER, TOWNEND. The food and habits of Beetles. (In Report of the Commissioner of Agriculture for the year 1868. Washington : 1869, pp. 78-117.)

The title sufficiently explains this work, which is of an elementary and practical character. 189 outline cuts are given of type species, chiefly American. Part 2 consists of an alphabetical index of plants and substances affected by different beetles, with the names of the latter.

GREDLER, VINCEZ. Zweite Nachlese zu den Käfern von Tirol. C. H. vi. pp. 1-18. (I. Nachlese, *ibid.* iii.)

Contains additions to and corrections of the author's first list, and descriptions of 2 new spp.

HAAG-RUTENBERG, —. Beiträge zur Familie der Tenebrioniden. (1. Stück.) C. H. vi. pp. 84-93.

Consists of descriptions of 13 spp. of *Himatismus* (*Epitragides*), of which 6 are described for the first time.

—. [See von HEYDEN.]

HAMPE, CLEMENS. Beschreibungen einiger neuer Käfer. B. E. Z. xiv. pp. 331-336.

Descriptions of 11 new species, from various localities.

HAROLD, E. VON. Notes sur quelques Coprides du Mexique. Ann. Soc. Ent. Fr. (4) pp. 493-512.

The author describes 8 species of *Copris* (6 new), 5 of *Pinotus* (3 new), 2 of *Ontherus* (1 new), 3 of *Eurysternus* (2 new), 8 of *Onthophagus* (all new). These are all from Sallé's collection, and appear to be partially known by various catalogue names.

—. Ueber Nomenclatur. (1. Stück.) C. H. vi. pp. 37-69.

Consists of general observations on the nomenclature of *Coleoptera*, incapable of abstraction. The author especially condemns the practice of not quoting the earliest works of Fabricius and others, points out numerous instances of the arbitrary use or rejection of the rule as to priority by modern writers, and indicates numerous errors of citation in catalogues.

—. Die Arten der Gattung Euparia. *Ibid.* pp. 19-30.

Two new species are described.

—. [See von HEYDEN.]

HEYDEN, LUCAS VON. Entomologische Reise nach dem südlichen Spanien, der Sierra Guadarrama und Sierra Morena,

Portugal und den Cantabrischen Gebirgen, — mit Beschreibungen der neuen Arten. B. E. Z. xiv. 1870 (Beiheft), pp. 1–176, Taf. ii.

The first part, pp. 1–56, contains accounts of various journeys by v. Heyden in the above-mentioned parts of Spain and Portugal, with notes of the exact localities of the insects observed. These are almost entirely *Coleoptera*, though some few names of *Hemiptera*, *Hymenoptera*, and *Diptera* are mentioned; the *Hemiptera* are to be described hereafter by Kirschbaum. The second part, pp. 57 (75 in error) –176, contains descriptions of new species, 141 in number, found in these journeys by v. Heyden and others: the descriptions are by v. Heyden, Dieck, v. Kiesenwetter, Scriba, Kraatz, de Saulcy, v. Harold, Desbr. des Loges, Haag, Seidlitz, Allard, Ch. Brisout, and Kirsch (some of those described by Dieck and Seidlitz are also referred to by those authors in other papers of the same publication for 1870). Three new genera are characterized, by v. Heyden, Kraatz and Dieck, and another is indicated by de Saulcy; and various observations are made upon species already recorded from the above localities. Two new species of *Choleva* are also described (in a note) by Kraatz, from Greece. At the end of the same Beiheft, pp. 211, 212, are descriptions by Loew of 5 new species of *Diptera* (gen. *Oxycera*, *Opsebius*, *Heteropogon*, *Holopogon*, and *Stenopogon*), which, from their localities, their capture by v. Heyden, and the quotation of Loew's name on the title of v. Heyden's paper, would seem to have been intended to be included in the latter.

The plate (ii.) contains outline figures of 7 of the most prominent of the species described, with some details.

HEYDEN, LUCAS VON. Revision der europäischen Hymenoptila-Arten. L. c. pp. 177–183.

The author reduces the European species of *Hymenoptila* to 8 (without reckoning two of Blanchard's species, unknown to him), of which he describes 3 as new.

—. Ueber blinde oder augenlose Käfer. Ber. senck. Ges. 1869–70, pp. 44–47.

Treats of the distribution of cave-beetles and of eyeless beetles not living in caves. All genera containing such insects are enumerated, with the number of their species, and general observations as to localities and habits.

JOSEPH, GUSTAV. Beiträge zur Kenntniss der in den Krainer Gebirgsgrotten einheimischen Arten der Gattung Anophthalmus. B. E. Z. xiv. pp. 261–270.

Contains descriptions of 2 new species. (N.B. This paper is repeated in JB. schles. Ges. xlvii. p. 173 *et seq.*)

KAWALL, J. H. Beiträge zur Kenntniss der Käfer in den

russischen Ostseeprovinzen Kurland, Livland und Estland
(Separat-Abdruck, C.B. Ver. Rig. xvii. 4), pp. 27.

A list of species, with biological observations.

KIESENWETTER, H. VON. Bemerkungen zur Nomenclatur der
Elateriden. C. H. vi. pp. 33–36.

———. [See VON HEYDEN.]

———. [See SCHAUM, H.]

KIRSCH, Th. Ueber deutsche Rüsselkäfer, &c. B. E. Z. xiv.
pp. 217 & 218.

Contains description of a new *Anoplus*, and observations on
Rhynchites and *Lina*.

———. Beiträge zur Käferfauna von Bogotá. Ibid. pp. 337–378.

Contains characters of 2 new genera and descriptions of 57
new species.

———. Beschreibung des Bostrichus (Tomicus) judeichii, n. sp.
Ibid. p. 388.

———. Neue Käfer-Arten aus Egypten. Ibid. pp. 389–396.

Contains descriptions of 10 new species.

———. [See VON HEYDEN.]

KOCH, GOTTLIEB VON. Abbildung und Beschreibung einiger
Käfer aus der Sturm'schen Sammlung in Nürnberg. Abh.
Ges. Nürnberg., Bd. iv. p. 89, Tab.

Figures and descriptions of *Hololepta procera* and *H. parallela*
(*Histeridae*), *Athyreus foveicollis* and *A. pilosus* (*Coproph.*), and
Ceroplesis vicina and *C. brevis* (*Longic.*).

KRAATZ, G. Clytus sternii, eine neue, deutsche Bockkäfer-Art.
B. E. Z. xiv. pp. 219 & 220, Taf. iii. f. 1 (to be given with
vol. xv.).

———. Ueber Feronia cuprea, L., und Verwandte. L. c. pp.
221–229.

———. Ueber Rhizophagus puncticollis, Sahlb., und vagæ,
Wancowicz. L. c. pp. 231 & 232.

———. Synonymische Bemerkungen. L. c. pp. 271 & 272.

———. Ueber Varietäten von Clytus-Arten. L. c. pp. 405–410,
Taf. iii. f. 2–4, a, b. Erstes Stück.

———. Dorcadion formosum, n. sp. L. c. pp. 410 & 411, Taf. iii.
f. 5.

———. Zur Abbildung eines deutschen Pärchens von Xylosteus
spinolæ, Friv. L. c. pp. 413–415, Taf. iii. f. 6, a–d.

KRAATZ, G. *Coryphium gredleri*, eine neue alpine *Omalinen*-Art. *L. c.* p. 416.

——. Ueber den Gattungsnamen *Trachys*. *C. H.* vi. pp. 31 & 32.

——. Ueber *Capnisa karelini*, Fald., aus Mangyschlak. *Hor. ent. Ross.* vii. pp. 407 & 408.

——. Eine neue russische *Clythra*-Art. *Ibid.* viii. pp. 29–31.

——. [See VON HEYDEN.]

LECONTE, JOHN L. Synonymical notes on North-American Coleoptera. *Ann. N. H.* (4) vi. pp. 394–404.

The author elucidates many species by an inspection of the types of Kirby, Newman, and Walker, and of others in Parisian collections.

LEPRIEUR, —. Notes sur le genre *Hæmonia* et spécialement sur l'espèce qu'on trouve dans les eaux de la Moselle. *Bull. Soc. Colm.* 1870, 1 pl., pp. 30.

The author gives instructions for the discovery of the species of this subaquatic genus, with a list of water-plants affected by them. He seems to regard *Hæmonia moselle* (Bellev.) as a var. of *H. equiseti*.

LOKAJ, EMANUEL. Verzeichniss der Käfer Böhmens. *Arch. Durchf. Böhm.* Bd. i. Abth. iv.

This complete catalogue of Bohemian *Coleoptera* (containing no synonymy or descriptions of new species, but consisting of names and localities only) occupies 77 pages of the "Arbeiten der zoologischen Section für Landesdurchforschung von Böhmen," published separately at Prag in 1869. The author enumerates 2867 species.

LUCAS, H. Note sur deux espèces nouvelles de *Pachydema*, Coléoptères Lamellicornes de la tribu des *Mélolonthides*. *Ann. Soc. Ent. Fr.* (4) ix. pp. 521–528.

——. Note sur la femelle du *Polyphylla mauritanica*. *Ibid.* pp. 529, 530.

MARSEUL, S. A. DE. Monographie des Mylabrides d'Europe et des contrées limitrophes en Afrique et en Asie. *L'Ab.* vii. 1870, March, pp. 1–56; April, pp. 57–88; June, pp. 89–144 (all that has come to the Recorder's hands as yet).

The author proposes to describe 137 species (including 28, treated by him as new), of which 97 are included in the above-mentioned portions.

——. Descriptions d'espèces nouvelles d'Histérides. *Ann. E. Belg.* xiii. pp. 54–138.

Contains characters of three new genera (with indication of

another) and descriptions of 81 new species (exotic), with re-descriptions of others; a synoptical table of species of *Paromalus* (pp. 103–108); and a supplement (pp. 126–136) to the author's Catalogue of *Histeridæ*, published in Nov. 1862, in Ann. Soc. Ent. Fr.

MILLER, L. Zwei neue Otiorhynchus-Arten. Verh. z.-b. Ges. Wien, 1870, xx. pp. 219, 220.

MORSCHOULSKY, VICTOR. Énumération des nouvelles espèces de Coléoptères rapportés de ses voyages (7^e article). Bull. Mosc. xlii. pp. 252–257, tab. viii. f. 12.

Treats of *Scydmanidæ* (characterizing three new genera) and a new genus of *Anobiades*.

——. Ditto. (8^e article). Ibid. pp. 348–354.

Two new genera and five new species are characterized (*Silphidæ* and *Nitidulidæ*).

——. Ditto. (9^e article). Ibid. xliii. pp. 18–49, tab. ii.

Treats of *Lucanidæ* solely.

——. Ditto. (10^e article). Ibid. pp. 379–407, tabb. iii. & iv.

Treats of *Tentyridæ* and other *Heteromera*. Four new genera are characterized in it, with many species apparently new; but it is almost impossible to feel certain as to this author's intentions with regard to these, some of which have certainly been described by him long ago.

MURRAY, ANDREW. List of Coleoptera received from Old Calabar, on the West Coast of Africa (continued from Ann. N. H. ser. 4, ii. p. 111). L. c. v. pp. 430–438 (June 1870); l. c. vi. pp. 44–56 (July 1870); pp. 161–176 (Aug. 1870); pp. 407–413 (Nov. 1870); pp. 475–482 (Dec. 1870), pls. ii. & iii.

Treats of the *Longicornia*. Six new genera and four new species are characterized.

——. On the Geographical Relations of the chief Coleopterous Faunæ. P. L. S. xi. no. 49, pp. 89.

The author's view of geographical distribution indicates a somewhat different original arrangement of land and water from that usually accepted. He considers that all *Coleoptera* in the world are referable to one or other of three great stirpes, which, in his opinion, sprung from one stirps, and have acquired distinguishing features by long isolation and changes in condition of life. These three stirpes are:—1, the Indo-African; 2, the Brazilian; and, 3, the 'microtypal' (so termed on account of its not containing such large or conspicuous insects as the others, and of which the English fauna and flora are stated to be standard types). The Indo-African stirps inhabits Africa south of the Sahara, India and China south of the Himalayas, the Malayan district, the Indian archipelago, and the New Guinea group, and is less modified by foreign elements than the next stirps. The Brazilian stirps inhabits

South and Central America east of the Andes and north of the River Plate, and furnishes a large share in the constitution of North America, receiving in turn a very perceptible tinge from the microtypal stirps. The microtypal stirps includes Europe, Asia north of the Himalayas, Eastern North America (so far as not modified by the Brazilian element), and (in a less degree) North-west America, California, part of Mexico, Peru, Chili, the Argentine Republic south of Tucuman, Patagonia, Tierra del Fuego, Polynesia, New Zealand, and Australia. The apparent paradox of including the first and last of these countries in the same stirps is endeavoured to be accounted for by the inference, from the fact of the Eocene flora of Europe having many points of correlation with the present Australian flora, and from the author's supposition of the probability of the European Eocene beetle-fauna having been the same as the Miocene (based upon Heer's proof that the Miocene beetle-fauna of Europe was of the same type as at present), that the Eocene fauna of Europe has (like the Eocene flora of Australia) survived in its Eocene form down to the present day. The author's conviction is that there have been almost certainly two great continental routes of communication between the northern and southern hemispheres—one now at the bottom of the Pacific, the other of the Atlantic. The beetle-fauna of the Madeiran Isles and of the Azores, as enumerated by Wollaston and Crotch, are considered substantially to corroborate the microtypal stirps, the European element (hitherto held to have been introduced) being treated as natural denizens. The entire fauna of St. Helena is discussed at some length (the author admitting that that island is the crucial test of his hypothesis of a communication between the northern and southern hemispheres by an Atlantic continent), and is regarded as belonging to the Atlantic subfauna of the microtypal stirps. Eastward, this stirps is traced through Siberia, China (due stress being given to the prevalence there of European forms), and Japan (where, however, as in China, the *Hymenoptera* are wholly different from the European type), to North America, thence, *via* California, to Mexico and the other South-American countries above mentioned. Coast- and cave-beetles, and the occasional occurrence of European genera, are relied upon as strong evidence of all these belonging to the same stirps,—the occurrence of South-African forms in South America being accounted for by a submerged Patagonian continent, which may have existed at three different epochs. The non-coral isles of *Polynesia* are claimed as microtypal, again chiefly on the ground of their possessing British forms; and the European affinities of a very considerable portion of the ingredients of the Coleopterous fauna of Australia are stated to be without doubt,—some peculiarly Australian forms being also thought to be local representatives of South-American (and *therefore*) European races. The common want of certain conspicuous families or genera by Australia and the microtypal stirps in other countries is relied upon by the author as a connecting link; and the Miocene epoch supplies some missing forms.

As regards the Indo-African stirps, the author's chief points are his present conviction (opposed to Wallace's opinion) that the *Coleoptera* of the New-Guinea islands are essentially Indo-Malayan,—that, although Africa (south of the Sahara) is better entitled to claim rank as a separate province than India, there was but one original stock for both, as most of the genera occurring in one are found, under suitable conditions, in the other, and some large groups (e. g. *Staphylinidae*) are absent in both of them,—that Africa was disjoined

from India before receiving such Australian types as occur at the Cape of Good Hope, and before the introduction of certain microtypal species referred to by the author,—that an important infusion of the Brazilian type in the West-African fauna (*cf.* Appendix) justifies his belief that Brazil and West Africa were formerly united (contrary to Bentham's expressed opinion),—and that the existence in Madagascar of a double fauna, one African and the other American, is to be accounted for by the conjecture that, when communication between the last Patagonia but one (for the author needs three successive and different countries in that quarter to carry out his theory) and the Cape was interrupted by the submergence of a continent, a broad raised ridge survived, running from Rio Janeiro obliquely across the Atlantic to a point a little to the south of the Cape of Good Hope, and thence to Madagascar; and this convenient ridge appears in the map of the Atlantic-bed in Keith Johnston's 'Physical Atlas.'

The Brazilian stirps appears to be more intelligible, its great difficulty, viz. the supposed connexion with Africa, being explained as above. The author considers that the large and splendid exponents of microtypal forms found in Brazil are due to superadded brilliancy consequent upon the special conditions of the locality. He does not, however, seem inclined to allow a similar agency to the microtypal forms occurring in China, Japan, and other countries, equally likely, judging from their undoubtedly indigenous species, to foster a similar development.

Tables are given, showing:—I. the actual present distribution of existing genera of *Coleoptera* (113), *Orthoptera* (6), *Neuroptera* (10), *Hymenoptera* (16), *Lepidoptera* (2), *Diptera* (18), *Hemiptera* (30), *Homoptera* (12), *Arachnoidea* (3), *Crustacea* (1), and *Polypi* (2) that have been recorded as Miocene; II. the geographical distribution of genera of *Coleoptera* (111) found in the middle and eastern portions of Polynesia; III. the relations of genera of New-Caledonian *Coleoptera* (Montrouzier); with lists of non-microtypal Polynesian species and their sources,—of genera and species found in Euræo-Asiatic regions and also in North-western America, but not in North-eastern America,—and of genera of Old Calabar, either Brazilian or with Brazilian affinities.

[Murray's views are contested by Wallace, who (in his Presidential Address, Pr. E. Soc. 1870, pp. lii–lxix) bases his opposition chiefly on an analysis of Wollaston's 'Insecta Maderensia.']

MURRAY, ANDREW. Reply to Mr. Frederick Smith on the Relations between Wasps and Rhipiphori. *Ann. N. H.* (4) v. pp. 83–93.

—. A last word in reply to Dr. Chapman and Mr. Frederick Smith on the Relations of the Wasp and Rhipiphorus. *Ibid.* p. 278.

—. Conclusion of the history of the Wasp and Rhipiphorus paradoxus, with description and figure of the Grub of the latter. *L. c.* vi. pp. 204–213, pl. xiv.

—. Note on the egg of *Rhipiphorus paradoxus*. *Ibid.* pp. 326–328.

PARRY, F. J. SIDNEY. A revised Catalogue of the Lucanoid Coleoptera; with remarks on the Nomenclature, and Descriptions of New Species. Tr. E. Soc. 1870, pp. 53-118 (March), pls. i.-iii.

The author corrects errors in and adds species &c. to his former Catalogue. He discusses various points upon which he is at variance with Gemminger and von Harold, characterizes a few new genera and some new species, and gives some original synonymy and observations upon rare or recently described species, adding a revised catalogue of the whole division of *Lucanoidea* (59 genera, 357 species). A new genus and some new species are described by H. Deyrolle in this paper.

PASCOE, FRANCIS P. Contributions towards a knowledge of the *Curculionidæ*. Part I. P. L. S. x. pp. 434-493 (pp. 434-458 pub. January 17, 1870; pp. 459-493 pub. May 20, 1870), pls. xvii., xviii., xix.

The author notes the confusion of analogies with affinities in the classification of this group; and, considering that no adequate genera have been erected for the reception of the numerous species discovered since the time of Schönherr, has selected indiscriminately as types of new genera such remarkable or obscure species as do not afford a ready clue to their systematic position. He also describes new species of recorded genera, and follows Lacordaire's arrangement, without adopting his "groupes," and converting his "tribus" into subfamilies. These subfamilies, 82 in number, are divided by the author into seven "categories," tabulated at pp. 436 & 437.

———. A Revision of the genus *Catasarcus*. Tr. E. Soc. 1870, pp. 13-40 (March).

The author describes 39 species (all but 5 new) of this Australian genus of *Brachyderides*.

———. Descriptions of some genera and species of Australian Curculionidæ. Ibid. pp. 181-209 (June), pl. 5.

Contains characters of 20 new genera and 45 new species.

———. Further descriptions of Australian Curculionidæ. Ibid. pp. 209-212 (June).

Descriptions of 3 other new species.

———. Descriptions of some genera and species of Australian Curculionidæ. Ibid. pp. 445-484 (Dec.), pl. 7.

Contains characters of 23 new genera and 61 new species.

———. Additions to the Tenebrionidæ of Australia &c. Ann. N. H. (4) v. pp. 94-107 (Feb. 1870).

Three new genera and 22 new species are characterized in this paper.

PERRIS, ÉDOUARD. Descriptions de quelques Coléoptères nouveaux, Rectifications et Notes. L'Ab. vii. pp. 3-37.

Consists of characters for three new genera, descriptions of 30 new species (all European), and observations upon the larvæ of various species.

——. Insectes dont les larves habitent la Vigne sauvage, le Pin, le Chêne ordinaire, le Chêne Tauzin et l'Orme. Ann. Soc. Ent. Fr. (4) ix. pp. 462, 463.

An account of rare *Coleoptera* found in the Landes in dead wood of the trees above specified.

——. Sur la larve de l'Olibrus affinis. Ibid. pp. 464-466.

——. Sur les mœurs des Mordellistena. Ibid. pp. 466-467.

——. Mœurs de la larve de l'Anobium paniceum. Ibid. p. 467.

PICCIOLI, FERDINANDO. Catalogo sinonimico e topografico dei Coleotteri della Toscana. Bull. Ent. Ital. ii. pp. 35-55, 244-259.

Comprises *Metabletus* to *Zabrus* of the author's slowly continued catalogue.

——. Rivista dei Coleotteri spettanti alla Fauna Sotterranea recentemente scoperti in Italia (e descrizione di due nuove specie Anottalme). Ibid. pp. 301-305.

——. Descrizione di due nuove specie di Coleotteri Italiani. Ibid. pp. 306-314.

The first of these papers is a general summary of the Italian cave-beetles. In the second (of which the title is included in the first by error) the author reproduces Müller's characters for *Glyptomerus*, of which he describes a new species, and also describes a new *Anophthalmus*.

PREUDHOMME DE BORRE, A. Addition à la notice sur les femelles à élytres lisses du *Dytiscus marginalis*. Ann. E. Belg. xiii. pp. 13-16, and c.-r. p. xxiv.

——. Considérations sur la classification et la distribution géographique de la Famille des Cicindélètes. Ibid. pp. 139-145.

PUTZEYS, J. Trechorum oculatorum Monographia. S. E. Z. xxxi. pp. 145-201, tab. i.

Concludes the work.

——. Note sur le genre *Perileptus*, Schaum. Ibid. pp. 362-364.

Seven species, of which two are new, are described.

RAGUSA, ENRICO. Descrizione di due nuove specie di Coleotteri trovate in Sicilia. Bull. Ent. Ital. ii. pp. 315 & 316.

REITTER, EDM. Beschreibung zweier neuer deutscher Pselaphiden. B. E. Z. xiv. pp. 212–216, Taf. i. figs. 6, 7.

Contains descriptions and figs. of a new *Batrissus* and a new *Euplectus* from Paskau.

——. Uebersicht der Käferfauna von Mähren und Schlesien. Brünn, 1870 (Separat-Abdruck, Bd. viii. Verh. Ver. Brünn), pp. 195.

Some of the species mentioned in this list are new for the German lists.

——. Ueber Oomorphus concolor, Sturm. B. E. Z. xiv. T. i. f. 8, a–h.

ROTTENBERG, A. BARON VON. Beiträge zur Coleopteren-Fauna von Sicilien. B. E. Z. xiv. pp. 11–40 (April 1870), pp. 235–260 (Jan. 1871), Taf. ii.

Consists of the commencement of an account of the result, as regards *Coleoptera*, of about six months' stay in Sicily, during the least favourable part of the year. The portion above noticed comprises from the *Cicindelidæ* to the *Edemeridæ* (inclusive), and one sporadic description of a new member of the *Otiorhynchides* from Naples. Localities &c. are given for numerous species, of which the *Carabidæ* and *Staphylinidæ* are stated to predominate [among the latter only 7 spp. of *Homalota*, all British, are recorded !]. One new genus is characterized, and 39 new species are described (one being withdrawn). Certain species are noted as new to the European lists, which are already included in De Marseul's Cat. On Taf. ii. five of these (Heteromorous) are figured, with details &c.

——. *Mastigus heydenii*, nov. spec. L. c. pp. 233, 234.

RUPERTSBERGER, MATHIAS. Biologische Beobachtungen. Coleopteren. Verh. z.-b. Ges. Wien, 1870, xx. pp. 835–842.

Contains descriptions of the earlier stages and observations on the economy of *Corymbites cinctus*, *Cæliodes fuliginosus*, *Ceuthorhynchus robertii*, *Gymnetron linariæ*, and *Chrysomela varians*.

RYE, E. C. Descriptions of new species &c. of *Coleoptera* from Britain. Ent. M. M. vii. pp. 6–9.

Contains descriptions of three new species of *Brachelytra* and of one *Anisotoma*, and additions of other recorded species to the British list.

——. Description of a new species of *Bythinus* from Great Britain. Ibid. pp. 33, 34.

SAHLBERG, JOHN. Finska arter af Coleopter-slågten *Hæmonia*, Latreille. Öfv. Fin. Soc. xii. pp. 64-69.

Two new spp. are described.

SAULCY, F. DE. Diagnosi di alcune specie nuove di Coleotteri Ipogei e descrizione di una nuova specie di *Reicheia*. Bull. Ent. Ital. ii. pp. 164, 165 (tav. 1. figs. 3, 3a).

——. [See VON HEYDEN.]

SAUNDERS, EDWARD. Catalogue of the species contained in the genus *Buprestis* of Linneus previous to its subdivision by Eschscholtz in 1829, referring each to its present genus. London: 1870, pp. 37.

Also contains a list of the Fabrician spp. of *Trachys*. Some synonymy is given, and changes in nomenclature are made.

SCHAUFUSS, L. W. Die bisherigen Arbeiten des Herausgebers. Nunquam Otiosus, Lief. i. pp. 24-49.

This contains an account of the sources of his collection, re-descriptions of various species described by himself, and a description of one new species.

——. *Pleocoma* staff, nov. sp. *L. c.* ii. pp. 50-59.

——. *Phosphaenopterus*, nov. gen. Malacodermata. *L. c.* ii. pp. 60, 61.

——. Drei neue *Hoplonyx*-Arten von New Germany in Natal. *L. c.* pp. 62, 63.

——. *Dorcadion brannani*, n. sp. *L. c.* p. 64.

SCHAUM, H., & KIESENWETTER, H. VON. Naturgeschichte der Insecten Deutschlands. Erste Abth. Coleoptera. Erster Band, zweite Hälfte; erste Lieferung, Bogen 1-9. Berlin: 1868, pp. 144.

The long-needed continuation of the first vol. of this well known work, comprising the *Dytiscidæ*, and undertaken by the late Dr. Schaum, has been completed from his MS. by v. Kiesenwetter. The *Haliphides*, *Pelobiudes*, *Hydroporides*, and *Agabi* appear to be almost entirely due to Schaum, the *Gyrinidæ* to v. Kiesenwetter, and all the rest to both authors in common. One new genus is characterized, two new spp. are described, and some changes in nomenclature (Stephensian names being in some cases allowed their due priority) are made in it.

The descriptions seem rather more hurried than those of the preceding volumes of this work.

SCHJÖDTE, J. C. De Metamorposi Eleutheratorum Observationes (Bidrag til Insekternes Udviklingshistorie). Nat. Tids. vi. pp. 352-378, tab. i. figs. 1-15, tab. ii. figs. 1-22. 1871. [VOL. VII.]

Continues the author's elaborate descriptions of larvæ of *Coleoptera* (*Buprestidæ*), the plates being, as usual, above praise.

SCHREIBER, —. Ueber Anthypna abdominalis, Fabr., und deren Larve. B. E. Z. xiv. pp. 1-10, Taf. i. figs. 1-5.

The economy of this insect is here described at some length.

SCHWARZ, EUGEN. Die Hydroporen-Fauna Schlesiens. JB. schles. Ges. xlvii. pp. 190-199.

SCRIBA, W. Lathrobium punctatissimum, n. sp. B. E. Z. xiv. p. 417.

SEIDLITZ, G. Revision der europäischen Arten der Gattung Strophosomus, Schh. B. E. Z. xiv. pp. 379-387.

The author subdivides and tabulates the 22 species which he records as European of this genus; he also indicates 5 new species, which are described in a 'Beiheft' of the same publication for 1870.

——. [See von HEYDEN.]

SHARP, DAVID. On the species of the genus Philhydrus found in the Atlantic Islands. Ann. N. H. ser. 4, v. pp. 13-16 (Jan. 1870).

Four spp. are described, of which two, from the Cape-Verdes, are treated as new.

——. On *Hydrobius* and allied genera. Ent. M. M. vi. pp. 253-256 (woodcut).

The author adopts Thomson's genera, and describes one new species.

——. Characters of a new genus and descriptions of new species of *Aleocharidæ* from Britain. Ibid. (1 May, 1870), pp. 279-282 (woodcut).

Five new species are described, and one other added to the British list.

SIEBOLD, C. TH. VON. Ueber Pädogenese der Strepsipteren. Z. wiss. Zool. xx. pp. 243-247.

[Cf. Kraatz, B. E. Z. xiv. pp. 47, 48.]

SMITH, FREDERICK. Concluding observations on the parasitism of *Rhipiphorus paradoxus*. Ann. N. H. ser. 4, v. pp. 198-204.

——. A word in explanation of a passage occurring in my "concluding observations on the parasitism of *Rhipiphorus paradoxus*." Ibid. p. 365.

SOLSKY, S. Coléoptères de la Sibérie orientale. Hor. Ent. Ross. vii. pp. 334-406.

After a short geographical outline of the districts from which the author has received his material, he notes as a phenomenon the extreme extension of tropical forms towards the north in Russian Asia, and the immediate contact of those forms with others essentially boreal; also the occurrence of several Japanese spp., and the existence of forms so close to well-known European insects that it is difficult to determine their specific value. Many known species are recorded, and one new genus and thirteen new spp. described,—some of Motschoulsky's and Mannerheim's species being also redescribed, and some original synonymy given.

SOLSKY, S. Staphylins de l'Amérique méridionale et du Mexique.—II. Bull. Mosc. xlii. pp. 257–267.

This paper is in continuation of the work on the *Staphylinidæ* of Mexico, published by the author in Hor. Ent. Ross. v. Nine new spp. are described in it.

——. Matériaux pour servir à l'étude des Insectes de la Russie.—V. Coléoptères de la Russie orientale. Ibid. pp. 359–467.

Articles I., II., III., & IV. appeared in Hor. Ent. Ross. iv. & v. Two new spp. are described, and some synonymy is given, in the present article.

SPRAGUE, PHILIP S. Notes on some of the common species of Carabidæ found in temperate North America. Canad. Ent. ii. pp. 44–47, 57–61, 96–98; woodcut, table, &c.

Treats of *Harpalus*, of which a few species are redescribed in a popular manner. An introductory chapter is given, with rough outline of external anatomy.

STIERLIN, GUSTAV. [See BISCHOFF-EHINGER.]

SUFFRIAN, E. Verzeichniss der von Dr. Gundlach auf der Insel Cuba gesammelten Rüsselkäfer. Arch. f. Nat. xxxvi. pp. 150–234.

Extends to *Apion* (on the old scheme of classification). Many new species are described.

TASCHENBERG, E. L. Neue Käfer aus Colombien und Ecuador. Z. ges. Naturw. 1870, Bd. i. pp. 177–199.

Contains descriptions of twenty-two new species, with observations upon others.

[For a somewhat depreciatory critique upon this paper, cf. v. Harold, C. H. vi. pp. 130 & 131.]

TARGIONI TOZZETTI, ADOLFO. Sull'organo che fa lume nelle Lucciole volanti d'Italia (*Luciola italica*). Bull. Ent.

Ital. ii. pp. 177-189, tav. i. f. 8, 14 bis, 15, 16, tav. ii. f. 4, 5, 8.

Enters minutely into the structure of the light-producing organs in this beetle, and gives highly magnified drawings of the photogenic lamellæ and their component cells &c.

THOMSON, C. G. *Coleoptera Scandinaviæ, eller Skandinaviens Coleoptera*, tom. x. Lund, 1868, pp. 420.

This completes the great Swedish naturalist's most original work, commenced in 1859. The present vol. (much disfigured by typographical errors) comprises:—1st, supplements to vol. v., containing the author's "Series" *Lamellicornes*, *Platysoma*, *Xylophagi*, *Fungicola* (pp. 1-80); vi. *Serricornes*, *Heteromera* (pp. 81-146); vii. *Rhynchophori* (pp. 147-224); viii. *Longicornes*, *Phytophagi*, *Aphidiphagi* (pp. 225-288); and consisting of tables of the various families, genera, and species of those "Series," with additions to the several volumes of recognized spp., or of fresh characters for those already recorded by the author, and descriptions of new spp.: 2ndly, 'Addenda et Emendanda,' pp. 289-349, being similar additions and descriptions relating to the whole work (through vol. ix.): 3rdly, 'Omissa,' pp. 350-358: and 4thly, an index of genera, species, and synonyms for the entire work.

The author founds the following new families, *Murmidiidæ* (p. 27) for the reception of *Murmidius ovalis* (Beck); *Hypophlæidæ* (p. 129), at the expense of the *Diaperidæ*, for the genus *Hypophlæus*.

——. Några för Sveriges Fauna nya Coleoptera. Opusc. Ent. fasc. ii. 9, pp. 124-140.

Two genera and 25 species (10 being new) are added to the Swedish fauna.

——. Bidrag till Sveriges Insect-Fauna. *L. c.* fasc. iii. 18, pp. 322-339.

Contains 24 species new to Sweden (8 treated as new to science).

——. Några ord om insect-kroppens sammansättning, särskilt medhänsyn till Coleoptera. *L. c.* 19, pp. 341-356.

This is an account of the author's views of the external anatomy of *Coleoptera*, with explanatory tables and two outline plates, which appear to be somewhat incorrectly lettered.

TRIMEN, ROLAND. On the occurrence of *Astraptor illuminator*, Murray, or a closely allied species, near Buenos Ayres. *P. L. S.* x. pp. 503 & 504.

A light-giving larva, closely allied to, if not identical with that mentioned by Murray (*l. c.* p. 74), is recorded by Trimen from Buenos Ayres. Such vague evidence as is produced in

this account is considered to strengthen the view that the larva is that of *Pyrophorus noctilucus*.

VOGEL, EDUARD. Beiträge zur Chrysomeliden-Fauna von Mittel- und Süd-Africa. Nunquam Otiosus, pp. 65-80.

WESTWOOD, J. O. Descriptions of twelve new exotic species of the Coleopterous family Pselaphidæ. Tr. E. Soc. 1870, pp. 125-132 (June).

Eight new genera also are characterized herein, rendering a modification of the existing classification of the family necessary.

WOLLASTON, T. VERNON. On the Coleoptera of St. Helena. Ann. N. H. ser. 4, v. pp. 18-37 (Jan. 1870).

The completion of the author's paper on the same subject, l. c. iv. (Zool. Rec. vi. p. 195). One new genus and nine new spp. are characterized.

——. On additions to the Coleopterous Fauna of the Cape-Verde Islands. Ibid. pp. 245-251 (Apr. 1870).

Two new spp. are described.

GENERAL NOTES.

BETHUNE (Canad. Ent. ii. pp. 76-82, 89-93, 105-110, 142-145, 168-176) reproduces the descriptions of species from Kirby's 'Fauna Boreali-Americana,' with a few notes. The *Carabidæ* are completed in this vol.

AB. DE PERRIN (Pet. Nouv. xvi. p. 61) criticises Stein's Catalogue, especially as to *Anophthalmus* and the *Malachides*.

REICHE (Nouv. et faits div. p. vi) dissents from Chaudoir's views upon certain *Carabidæ* published in L'Ab. vi. pp. 148-150.

PASCOE (P. L. S. x. p. 459 and note) refers to substances growing on the external surface of certain *Curculionidæ* and of one of the *Heteromera* (*Saragus floccosus*) recently described by him. The flocculence on the latter has been pronounced by Currey to be an undoubted fungus of the genus *Isaria*; and the insect is stated by its captor to have been taken on trees covered with a similar white lichen. Carruthers, on the other hand, considers the substance to be a grumous mass, with no trace of a mycological character (cf. Zool. Rec. vi. p. 180).

WALSH (Amer. Ent. & Bot. ii. p. 298) records *Chramerus icorizæ* (Lec.), a *Magdalinus* allied to *barbitus* (Say), and *Cis*? *pumicatus* (Mell.) as bred by him from fungus on the Pig-nut Hickory (*Carya glabra*) in N. America.

Extracts from a paper by Huntley, entitled "Remarks on some of the Coleopterous insects which injure fruit- and other trees in the neighbourhood of Wellington," are given in Tr. N. Z. Inst. i. p. 29.

Coleoptera supposed to be antagonistic to the "Plum Curculio" (*Conotrachelus nenuphar*) are described and figured in Amer. Ent. i. pp. 34 and 35.

DE MARSEUL (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. ixix) refers to the damages caused to *Brassica oleracea* by *Coleoptera*.

J. F. SCOTT (Ent. M. M. vii. p. 156) notes the occurrence of *Opilus mollis* and *Callidium variabile* at sugar placed as a bait for moths.

PERRIS (Nouv. et faits div. p. x) records two *Necrophorus vestigator*, two *Catops watsoni*, and ten specimens of a *Homalota* found in a dead *Cerambyx*.

ÖBERTHÜR (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xlix) records large quantities of *Coleoptera* flying near or running on the surface of the ground close to the crater of Vesuvius, and suffocated in small holes exhaling hot sulphurous vapour. Emery (Pet. Nouv. 26, p. 104) recapitulates the prior accounts of Costa and Carusi on the same subject.

BUTLER (Ent. M. M. vii. p. 59) records Spaight's evidence of certain large *Lucanidae* and *Longicornia* at Moulton, N. India, habitually sawing off small branches of trees in order to get at the exuding sap.

PERRIS (Nouv. et faits div. p. xi) adds *Eucinetus meridionalis*, *Elatér nigerimus*, *Dorcatoma setosella*, *Pogonocherus decoratus*, and *Asemum striatum* to his list of insects infesting *Pinus maritima*.

For notes by Gilnicki on the beetles of the cave of Punto, cf. Bull. Ent. Ital. ii. p. 295. The same author (Pet. Nouv. 25, p. 100) makes some observations on Cavern collecting.

BONVOULOIR (*ibid.* 28, p. 111) adds his experiences on the same subject.

JOSEPH (JB. schles. Ges. xlvii. pp. 169-172) discusses the distribution of species in different caves of Carinthia, and their general geographical extension; he also notes certain facts concerning cave-insects which appear to contradict the theory of descent, being of opinion that Darwin's acceptance of the descent of eyeless subterranean spp. from eyed upper-world insects is as yet supported by no single fact.

PETTITT (Canad. Ent. ii. pp. 53, 65, 84, 102, 117, 131, 151) continues his list of *Coleoptera* from Ontario, from the *Hydradephaga* to the *Rhynchophora* inclusive, containing several spp. not previously recorded in the Canadian lists; and (*l. c.* p. 156) records the result of sifting for beetles at Ontario.

PACKARD (Canad. Ent. ii. p. 119) gives a list of *Coleoptera* collected at Caribou Island, Labrador, Straits of Belle Isle, in which are indications of some new spp.

In protocol of 47th meeting of Soc. Imp. des amat. des sc. nat. &c. at Moscow, January 1870, pp. 233-237, is an enumeration by Ballion of *Coleoptera* from Irkoutsk. Indications of new species occur in it.

SCHÖDTE (Nat. Tids. ser. 3, vol. v. pp. 543, 544) makes some additions to the Danish list of *Cerambycidae*, *Buprestidae*, and *Elatéridae*.

SCHWARZ (JB. schles. Ges. xlvii. p. 188) records *Coleoptera* found on the Galatz Alps.

FUSS (Verh. siebenb. Ver. viii. Hft. 3, p. 335 *et seq.*) gives a catalogue of 2810 spp. of *Coleoptera* occurring in the Siebenbürg district.

KITTEL (20th Ber. Ver. Augsburg.) gives additions to and corrections of the list of *Coleoptera* of Augsburg published in the 12th and 19th publications of the same society.

LETZNER (JB. schles. Ges. xlvii. p. 180) records spp. new to Silesia.

PIOCHARD DE LA BRÛLERIE gives an account of his Syrian expedition; as regards *Coleoptera*, Ann. Soc. Ent. Fr. 4^e sér. ix. Bull. p. lxxxi, and x. Bull. pp. xviii-xxii.

BAUDUER (Nouv. et faits div. p. xxx) records rare *Coleoptera* found during the winter.

BEDEL records rare French *Coleoptera* (*ibid.* pp. xxiii, xxx, xxxiv-xxxix).

BELLIER DE LA CHAVIGNERIE (*ibid.* pp. xliii, xlvii) records *Coleoptera* taken at Digne, Lower Alps.

ABEILLE DE PEBBIN (*ibid.* p. xlvii) adds six species to the list of French *Coleoptera*.

CHAMPION (Ent. M. M. vi. p. 231, vii. pp. 12 and 136), TAYLOR (*ibid.* vii. p. 80), MORLEY (*ibid.* p. 107), MONCREAFF (*ibid.* p. 154), and GORHAM (*ibid.* p. 155) record rare British *Coleoptera*.

HISLOP (*ibid.* p. 10) and E. A. WATERHOUSE (*ibid.* p. 81) record rare Scotch *Coleoptera*.

CICINDELIDÆ.

P. DE BORRE (Ann. E. Belg. xiii: pp. 139-145) makes some general observations on the classification and geographical distribution of this family, tending to corroborate the Darwinian theory.

Alterations in the colour of *Cicindela hybrida* and *C. campestris*, caused by artificial means, are referred to in Tijdschr. Ent. 2nd ser. Deel v. pp. 178 & 179.

Amblychila piccolomini, Reiche, = *cylindriciformis*, Say: Lec., Ann. N. H. ser. 4, vi. p. 402.

Cicindela dongolensis, Klug, 1832, = *fimbriata*, Dej., 1831, Crotch, C. H. vi. p. 95; *C. obliquata*, Kirby, *kirbyi*, Lec., = *vulgaris*, Say, Leconte, l. c. p. 395; *C. tarsalis*, Lec., = *blanda*, Dej., Leconte, *ibid.* p. 402.

BALLION (Bull. Mosc. xlii. p. 211) corroborates Gemm. and v. Harold's reference of *Cicindela granulata*, Gebl., as a syn. to *C. burmeisteri*, Fisch., the latter having about two months priority.

CARABIDÆ.

Elaphrines.

Elaphrus politus, Lec., = *clairvillei*, Kby., *E. californicus*, Mann., = *intermedius*, Kby.: Lec., Ann. N. H. ser. 4, vi. p. 396.

Omophron nitens is to be referred to Leconte, and not to Chaudoir: Lec., *ibid.* p. 402.

Carabides.

v. HEYDEN (B. E. Z. xiv. Beiheft, p. 55) tabulates the distribution of Spanish and Portuguese mountain spp. of *Carabus*, *Nebria*, and *Leistus*.

BARGAGLI (Bull. Ent. Ital. ii. p. 269) notes the larva and perfect insect of *Calosoma sycophanta* decimating the larvæ of *Liparis dispar* in Sardinia.

GOUBERT (Pet. Nouv. 15, p. 54) records a remarkable var. of *Carabus morbillosus* from Kabylia.

LUCAS (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. 1v) records *Nebria complanata* (L.) var. from Brittany.

FREY-GESSNER (Mitth. schw. ent. Ges. iii. pp. 210-215) gives alpine localities for and general particulars concerning *Nebria escheri* and *bremii*, Heer, and *Leistus montanus*, Steph.

Calosoma irregulare, Walk., = *tepidum*, Lec., var.; *Callisthenes pinelioides*, Walk., *zimmermanni*, Lec., = *luxatum*, Say; *Carabus bicolor*, Walk., = *Calosoma laqueatum*, Lec.: Lec. Ann. N. H. ser. 4, vi. p. 399. *Cychrus germari*,

Chaud., = *andrewsii*, Harr. ; *C. (Sphæroderus) granulosus*, Chaud., *brevoorti*, Lec., = *lecontei*, Dej. ; *C. (S.) schaumii*, Chaud., = *nitidicollis*, Chevr. : Lec. *ibid.* p. 402.

Calosoma granulosum, Mots., should be erased as a good species ; and remarks upon its relations to *C. denticolle*, Geb., are made by Ballion (Bull. Mosc. xlii. p. 214, *et seq.*).

Carabus sublevis, Drap., from S. Russia, = *violaceus*, L. ; *C. detritus*, Drap., from Hungary, = *germari*, St., = *violaceus*, var. : Putzeys, Ann. E. Belg. xiii. c.-r. p. ix.

Cathaicus, g. n., H. W. Bates, Ent. M. M. vii. p. 32. Allied to *Damaster*, but with thorax much broader than long, and with no trace of lateral angulation or post. sinuation, and mandibles much shorter and wider. Also allied to *Coptolabrus*, but with apical joint of max. palpi much shorter than preceding. Sp. *C. swinhoei*, sp. n., H. W. Bates, *l. c.* p. 33, Pekin.

Od(ont)acanthides.

The question of *Odontacantha* versus *Odacantha* is argued by v. Kiesenwetter and v. Harold, C. H. vi. pp. 114-116.

Brachinides.

CROTCH (Nouv. ét.faits div. no. 11) reproduces the diagnoses of *Brachinus joenius* and *B. siculus*, Patti, probably not referable to *Brachinus* proper.

Lebiades.

Lebia gracilis (Mots.) is to be erased from Gemm. and v. Harold's Cat. : Ballion, Bull. Mosc. xlii. p. 212 : the double use of the names *Lebia cyanella*, *plagiata*, and *trisinata* is pointed out by Ballion (*l. c.* p. 217), who proposes the name *menetriesi* for *L. trisinata*, Mén.

Cymindis baudueri, sp. n., Perris, L'Ab. vii. p. 3, Sos (Lot-et-Garonne).

Pericalides.

In Ann. E. Belg. xiii. c.-r. p. xvi, is a collected list of synonymy of certain spp. published almost simultaneously by H. W. Bates and Baron de Chaudoir. These have already appeared in Zool. Rec. vi. on Bates's authority, and are also given in Ent. M. M. vii. p. 10.

Ditomides.

Aristus nitidus, Fald., Gemm. & v. Har. Cat., is non-existent ; *Ditomus cyaneus* is to be referred to Oliv., and not to Dej. Ballion, Bull. Mosc. xlii. p. 213.

Aristus haagii, sp. n., v. Heyd. B. F. Z. xiv. Beiheft, p. 59, Sierra Nevada, Alicante, Carthage.

Graphipterides.

CHAUDOIR (Bull. Mosc. xlii. p. 284 *et seq.*) monographs the species included by him in this subfamily, of which he gives characters. According to him, *Piezia andersoni*, Chaud., = *angusticollis*, Boh. ; *P. fasoglica*, Thoms., ? = *axillaris*, Brullé, var. ; *Graphipterus luctuosus*, Luc., *rotundatus*, *intermedius*, and *reichei*, Guér., = *peletieri*, Casteln. ; *Piezia laterapis*, Boh., is a *Gra-*

phipterus, and is renamed *atrimedius*; *G. tristis*, Klug., = *salina*, Bertoloni; *Piezia limbata*, *G. lutescens* and *parvicollis*, Chaud., *G. marginellus*, Guér., = *limbatus*, Casteln.; *G. obtusus*, Boh., = *vestitus*, Dej.; *G. obsoletus*, F., Dej., nec Ol., = *4-lineatus*, Brullé; *G. rotundipennis*, Chaud., = *lineatus*, Kl., var.; the name *leucophæus* is proposed for a species from L. N'gami, possibly distinct from *G. bilineatus*, Boh.; *G. obscurus*, Gory., = *trivittatus*, Gory, abraded; *G. rouxi* and *hopei* (nec *hoppei*), Casteln., = *arcuatus*, Gory.

Piezia mnischei, sp. n., Chaud. l. c. p. 289, L. N'gami; *P. livingstoni*, sp. n., Chaud. l. c. p. 290, Zambèzi.

Graphipterus. Chaudoir, l. c., describes the following new spp.:—*G. kindermanni*, p. 299, Alexandria; *lugens*, p. 303, L. N'gami; *mouffleti*, p. 307, Benguela and ? C. of G. Hope; *griseus*, p. 309, C. of G. Hope; *bonvouloiri*, p. 310, L. N'gami; *comptus*, p. 313, Abyssinia, White Nile; *andersoni*, p. 319, L. N'gami; *giganteus*, L. N'gami, and *fasciatus*, Caffraria, p. 323; *discoides*, Zulu territory, and *6-vittatus*, C. of G. Hope, p. 327; *bivittis*, p. 329 (?? = *bi-vittatus*, Boh.), *tibialis*, p. 330, *quadrum* and *suturiger*, p. 335, L. N'gami; *ferruginosus*, p. 337, Natal; *canescens*, p. 338, Lagoa Bay.

Scaritides.

Dyschirius angustatus (Ahr.) is recorded by Moncreaff from the S. coast of England (Ent. M. M. vi. p. 213).

Pasimachus viridanus, Lec., = *mexicanus*, Gray: Lec., Ann. N. H. ser. 4, vi. p. 403.

Reicheia ussilaubi, sp. n., Saulcy, Bull. Ent. Ital. ii. p. 165, Florence.

Dyschirius microphthalmus, sp. n., v. Heyd. B. E. Z. xiv. Beiheft, p. 58, Northern Portugal.

Chlœniides.

v. ROTTENBERG (B. E. Z. xiv. p. 14) notes an apparently undescribed var. of *Chlœnius velutinus* (Duft.) from Sicily.

Chlœnius brevilabris, Lec., = *quadricollis*, Kby.; *C. impunctifrons*, Kby. nec Say, = *pennsylvanicus*, Say: Lec., Ann. N. H. ser. 4, vi. p. 397.

Corrections &c. in the references of *Chlœnius karelini*, Mann., *C. chlorodius*, Dej., and *C. brominus*, Laf., in Gemm. and v. Harold's Cat. are made by Ballion (Bull. Mosc. xlii. p. 213), who proposes the name *gemmingeri* for *C. cursor*, Laf. (nec Chev.), p. 214.

Harpalides.

A larva, supposed to be that of *Harpalus pennsylvanicus* (De G.), is figured and described in detail in Amer. Ent. i. p. 34, f. 26. It feeds upon the larvæ of the "plum curculio" (*Conotrachelus nemophar*).

Harpalus caliginosus, Say, is noted as a vegetable feeder, Amer. Ent. i. p. 80.

THOMPSON (Opusc. Ent. fasc. iii. p. 323) gives diagnostic characters for *Ophonus puncticollis* (Payk.) and *O. brevicollis*, Dej., describing also a third allied sp.

LUCAS (Ann. Soc. Ent. Fr. 4^e sér. ix. Bull. p. lxii) describes the flight of numbers of *Dichirotrichus obsoletus* and *D. pubescens* by night, on the lighthouse at Honfleur.

Anisodactylus harrisii, Lec., = *laticollis* (Kby., Harp.); *Harpalus obesulus*, Lec., = *basilaris*, Kby.; *H. fulvilabris*, Mann., ? = *ochropus*, Kby.: Lec. Ann. N. H. ser. 4, vi. p. 397; *H. defixus*, Walk., probably = *cautus*, Dej.: Lec. *ibid.* p. 400. *Eurytrichus*, Lec., = *Anisotarsus*, Chaud.; *Selenophorus beauvoisii*, Dej., does not occur in the United States: Lec., *ibid.* p. 403.

Harpalus motschulskyi, Gemm., = *latus*, Mots., is a good sp., very distinct from *H. hirticollis* (Ill.); *H. acuminatus*, Mots., is entirely different from *pezzus*, Mén., with which Gemm. unites it. Solasky, Bull. Mosc. xlii. p. 466.

Ophonus rectangulus, sp. n., Thoms. l. c. p. 323, Sweden.

Acupalpus vittatus, sp. n., v. Heyd. B. E. Z. xiv. Beih. p. 63, Escorial; (*Stenolophus*) *piceus*, sp. n., v. Rottenberg, B. E. Z. xiv. p. 16, Sicily.

Feroniades.

KRAATZ (B. E. Z. xiv. pp. 221-229) reviews the spp. of *Feronia* (*Pæcilus*) confused with and allied to *cuprea* (L.). He considers Thomson's *puncticeps* the typical *cuprea* (L.), to which also, as varieties, must be referred *beryllina* and *viridis*, Preller, *cursoria*, Heer, *erythropus*, Fald., *affinis* (Sturm), *anatolica*, Chaud., and possibly *reichii*, Waltl [*nec reichiei*, as in de Mars. and Gem. & v. Har.]. The *pauciseta* of Thomson he identifies with the hitherto unintelligible *versicolor* of Sturm (by means solely of Sturm's figure), and to that insect attributes as vars. *cupræoides*, Heer, and *subcyanea*, Preller. To *cursoria*, Dej., he refers *festiva* (Kinderm. ined.) and, with doubt, *cyanella*, Reiche, both from Asia Minor, as vars.; and to *quadricollis*, Dej., he attributes *cyanea*, Gory, as a syn. Kraatz also refers to *P. anatolicus*, Chaud., and *vicinus*, Levrat, and *F. reichetana*, Peyr., and demurs to *P. crenato-striatus*, Chaud., being sunk by Gemm. & v. Harold as a var. of *crenatus*, Dej., thinking, however, that it is not separable specifically from *lugubris*, Dej. (= *punctifrons*, Chaud.).

BALLION (Bull. Mosc. xlii. p. 212) objects to Gemm. & v. Harold's reference of *Feronia* (*Pæc.*) *nitens*, Chaud., to *lepida* (F.) as a var.; if not of specific value, Chaudoir's insect should be referred to *lævicollis*, Chaud.

G. DES COTTES (Mitth. schw. ent. Ges. iii. pp. 297-305) redescribes nine spp. of *Orthomus*, which he considers entitled to separate generic rank from *Feronia*.

DIECK (B. E. Z. xiv. Beiheft, p. 61, and note) describes a var. of *Platyderus dilatatus* from Algesiras, under the name of *algesiranus*, and hints a belief that connecting links between *P. dilatatus* and *ruficollis* may be found, as he has taken an intermediate form between *lusitanicus* and *varigns* [apparently not being aware that the latter has for some years been sunk as a var. of *lusitanicus*].

Abacetus. Chaudoir (Bull. Mosc. xlii. pp. 355-400) monographs the spp. of this genus, describing many new spp., and rejecting the older name *Dicælinus* (M'Leay), of which Schaum has stated the type to be an *Abacetus*, and to be in Brit. Mus., as M'Leay's types are in E. India Mus., and the description does not substantiate the proposition. *Distrigus costatus*, Nietn., = *A. atratus*, Dej.; *A. percoides*, Fairm., is altered to *percusioides*; *Astygis æquicollis*, Mots., = *Ab. salzmanni* (Germ.); *A. viridulus*, Fairm., is possibly to be referred to *Distrigus madagascariensis*, Dej.; *A. elongatus*, Fairm., is changed to *lævicollis*; *Distrigus submetallicus*, Nietn., = *A. antiquus*, Dej.; *Feronia* (Arg.) *gilvipes*, *pygmæa*, *obtusa*, and *pumila*, Boh., *Cælostoma flavipes*,

Mots. (? = *Dist. dejeani*, Nietn.), and *Dist. picipes*, Mots. (? = *antiquus*, Dej.), *Argutor discolor*, Roth, Fer. (*Arg.*) *fuscipes* and *parvula* (Klug) are all with more or less certainty referred to *Abacetus*; *Dist. æneus*, Nietn., is changed to *nietneri*; *Argutor degener* and *A. relinquens*, Walker, and many of Castelnau's spp. of *Drimostoma*, are probably to be referred to *Abacetus*: Chaudoir, *ibid.* *Distrigus bipustulatus*, Brullé, is to be referred to *Metaxyus*, Chaud.: Chaudoir, l. c. p. 400.

Argutor bicolor (Kby.) = *patruelis*, Dej.; *Cryobius fastidiosus*, Mann, *frigidus*, Esch., ? = *brevicornis* (Kby., *Arg.*); *A. mandibularis* (Kby.), = *Cryobius riparius* (Dej.); *Amara gibba*, Lec., = *discors*, Kby.: Lec., Ann. N. H. ser. 4, vi. p. 397.

Pterostichus flebilis, Lec., = *Feronia mœrens*, Newm., which, with *adjunctus*, Lec., probably is an elongate form of *coracinus*, Newm.; *F. picipes*, Newm., *strigillata*, Harr., = *P. stygicus*, Say; *F. (Pæc.) atrata*, Newm., = *P. permundus*, Say; *Evarthrus conviva*, Lec., = *F. orbata*, Newm.; *E. orbatus* and *fatuus*, Lec., and *F. corax*, Lec., = *sodalis*, Lec.; *Omasseus colligatus*, Walk., = *Pterost. (Bothriopterus) oregonus*, Lec.; *Amara extensa*, Walk., is a *Harpalus*; *A. communis*, Walk., = *impuncticollis*, Say: Lec., *ibid.* p. 399.

Amara quenseli (Schön.), is recorded from Scotland by Hislop (Ent. M. M. vi. p. 212).

For a discussion on *Zabrus gibbus* and its larva, cf. Cornelius, Verh. Ver. Rheinfl. xxvi. Corr. Bl. pp. 20-28.

v. HEYDEN (B. E. Z. xiv. Beiheft, p. 56) tabulates the localities of Spanish and Portuguese mountain spp. of *Zabrus*.

Aulacocœlius, g. n., Chaudoir, l. c. p. 405. Allied to *Cœlostomus* and *Abacetus*; apex of ligula much dilated, three last segments of abd. transversely canaliculate in front. Sp. *A. liopleurus*, sp. n., Chaud. l. c. p. 406, Carpenter Bay or Luçon.

New species:—

Feronia (Tapinopterus) cephalotes, Des Cottes, Mitth. schw. ent. Ges. iii. p. 260, Pontic Alps; *F. (Omasseus) simulata*, Des C. l. c. p. 261, Trebizond; *F. (Orthomus?) pommereau*, Perris, L'Ab. vii. p. 4, Algeria.

Platyderus vuillefroyii, Dieck, B. E. Z. xiv. Beiheft, p. 60, Algesiras.

Abacetus. Chaudoir, l. c., describes the following new spp.:—*A. longiusculus*, p. 356, Egypt [entire description comprised in ten words!]; *subpunctatus*, Senegal, *cordicollis*, Tranquebar, Ceylon, p. 357; *reflexus*, N. Hindostan, *ænigma*, Hong Kong and ? Cochin-China, p. 358; *marginicollis*, p. 359, Rangoon; *curtus*, p. 360, Senegal; *punctatosulcatus* and *creniperennis*, p. 361, *oblongus*, p. 362, White Nile; *gagatinus*, p. 363, Senegal; *rufipalpis*, p. 365, Natal; *anomalus*, p. 367, Ceylon; *politus*, p. 368, Deccan; *politulus*, p. 369, Rangoon; *subglobosus*, p. 371, Gaboon; *hirmocœlus*, p. 372, Rangoon; *cyathoderus*, p. 373, and *guttula*, p. 374, Deccan; *australis*, p. 375, Moreton Bay (? = *Drimostoma vicinum*, Casteln.); *natalensis*, p. 377, *nanus*, p. 379, Natal; *drimostomoides*, Senegal, *gondati*, Madagascar, *4-maculatus*, N. Hindostan, p. 380; *æneobus*, Angola, Senegal, *quadricollis*, Martaban, p. 382; *dilitipes*, p. 383, Siam; *maculipes*, Martaban, *chalcœolus*, N. Hindostan, p. 384 (in error, 394); *convexiusculus*, p. 385 (in error, 395), Celebes; *pallipes*, p. 386, Martaban (? = *Distrigosus bipunctatus* and *D. rufulus*, Mots.); *4-guttatus*, p. 387, Martaban; *4-notatus*, p. 388 (in error, 398), Bengal; *striatus*, p. 393,

C. of G. Hope; *chalcus*, p. 394, Natal; *tibiellus*, p. 395, C. of G. Hope; *rufotestaceus*, p. 398, Deccan; *ferrugineus*, p. 399, E. Indies (figured by Schm.-Goebel, Faun. Birm. t. 2. f. 6, *Holconotus id.*, but not described).

Chlaenius (Mots.). Chaudoir, l. c. p. 401, recharacterizes this genus, and describes the following new spp.:—*C. biplagiatus*, p. 402, Rangoon; *4-plagiatus*, Deccan, *cruciatus*, Bengal, p. 403.

Amara amabilis, Hampe, B. E. Z. xiv. p. 331, Agram.

Anchomenides.

THOMSON (Opusc. Ent. fasc. iii. p. 322) gives short diagnostic characters for *Anchomenus uliginosus*, Er., and *A. assimilis* (Payk.).

RYE records *Anchomenus versutus*, var. *lugubris* (Dfts.), from England (Ent. M. M. vii. p. 36).

Anchomenus angusticollis (Kby., nec F.) = *stygius*, Lec.; *Agonum seminitidum*, Kby., *A. chalcum*, Lec., = *cupreum*, Dej.; *A. erythropum*, Kby. P = *subcordatus*, Lec.: Lec., Ann. N. H. ser. 4, vi. p. 396.

Sphodrus exaratus, sp. n., Hampe, B. E. Z. xiv. p. 331, Croatia.

Calathus. G. des Cottes (Mitth. schw. ent. Ges. iii. April 1870) describes the following spp.:—*C. arcuatus*, p. 257, figs. 1, 1a (but no plate is given); *ordinatus*, p. 258, *deyrollei* (fig. 2, as above) and *subsimilis*, p. 259, Trebizond. [He also treats *C. uhagoni*, p. 260, as new, having already described it in Pet. Nouv. of Dec. 15, 1869!].

Pogonides.

V. KIESENWETTER (C. H. vi. p. 113) replies to Reiche's defence of his *Patrobis napoleonis*, and comments upon the personal tone of Reiche's remarks.

Pogonus atrocyaneus, sp. n., v. Heyd., B. E. Z. xiv. Beiheft, p. 60, Bay of Cadiz.

Trechides.

Trechus. Putzeys (S. E. Z. xxxi.) completes the first part of his monograph, giving the following synonymy &c.:—*T. piciventris*, Graells, = *minus* (F.); *T. piciventris*, Pandellé, is renamed *pandellei*, p. 150; *T. vittatus*, Graells, probably = *Acupalpus dorsalis* (F.), *ibid.*, note; *T. kamtschatkensis* Putz., = *apicalis*, Mots.; *T. californicus*, Mots., is from Russian America; *T. maurus*, Putz., probably = *nigrinus*, Putz., var.; the genus *Cnides* (Mots.) is erroneously characterized, and simply = *Trechus*.

Trechus spelæus, Reitter, 1869, = *microphthalmus*, Mill.: Kraatz, B. E. Z. xiv. p. 271.

DECK (*ibid.* p. 184, note) shortly describes an *Anophthalmus* under the name of *consorranus*, as a var. of his *A. orpheus*, with indications of an opinion that it is entitled to specific rank.

JOSEPH (*ibid.* p. 260 *et seq.*) discusses 9 species of *Anophthalmus* from the Carinthian grottoes, and describes 2 as new. He considers *A. globulipennis* (Schm.) not specifically separable from *A. schaumii* (Schm.), of which he notes a var. *planipennis*. These observations &c. are also published in JB. schles. Ges. xlvii. p. 173 *et seq.*

Perileptus. Putzeys (S. E. Z. xxxi. pp. 362–364) describes 7 species of this genus, adopting Schaum's name in preference to the prior *Ochtheophilus* of Nietner.

Trechus. Putzeys (S. E. Z. xxxi.) describes the following new spp.:—*T. dejeani*, p. 148, Transylvania; *elongatulus*, *ibid.*, Caucasus; *holohissus*, p. 153, Chili; *variicornis*, p. 154, Bolivia; *suturalis*, p. 156, Reinosá; *longobardus*, p. 158, Lombardy Alps; *regularis*, p. 159, Styria; *cardioderus* (Chaud. MS.), p. 160, Transylvania (? *spec. distincta*, *sec. auct.*); *canadensis*, *ibid.*, Newfoundland, Toronto; *binotatus*, p. 165, Tuscan Apennines; *levissimus* (PP = *Trechisibus æneus*, Mots.) and *proximus*, p. 169, *parvicollis* and *scapularis*, p. 170, *axillaris*, p. 171, Chili; *panamensis*, p. 172, Panama; *indicus*, p. 175, E. Indies; *syriacus*, p. 178, Syria; *vicinus*, p. 179, Armenian Alps; *tingitanus*, p. 180, Tangiers; *archavaletæ*, p. 188, Montevideo; *fasciger*, p. 189, and *monolcus*, p. 191, Chili; *diecki*, p. 195, S. Spain.

Trechus heeri, sp. n., Tournier, S. E. Z. xxxi. p. 194, Mt. Sents, Switzerland, Taf. 1. f. 7.

Anopthalmus pubescens, sp. n., Joseph, l. c. p. 268, *A. capillatus*, sp. n., Joseph, l. c. p. 269, Carinthia; *A. croaticus*, Hampe, *ibid.* p. 332, Croatia; *A. brucki*, sp. n., Piccioli, Bull. Ent. Ital. ii. p. 306, Apennines.

Perileptus stierlini and *P. testaceus*, spp. nn., Putz. l. c. p. 363, Algeria.

Bembidiades.

v. ROTTENBERG (B. E. Z. xiv. p. 19) briefly describes, without naming, a species of *Bembidium* from Sicily, which he considers to be the insect erroneously referred by Du Val to *B. præustum*, Dej. (= *siculum*, Dej., var.).

THOMSON (Opusc. Ent. fasc. ii. p. 124) records *Bembidium clarkii*, Daws., from Sweden.

G. DES COTTES (Mitth. schw. ent. Ges. iii. p. 264) makes the following observations upon the 4-spotted group of *Tachys*:—*T. tetraspilota* (sibi) = *diabrachys*, Kolen., and is perfectly distinct from *T. 4-signata* [but cf. Des Cottes, *ibid.* p. 133, where he himself identifies these two insects]; De Marsseul, moreover, is wrong in uniting *tetraspilota* to *angustata* (Dej.). A new species, from Corsica, is indicated, under the name *corsica*. *T. anomala*, Kolen., has nothing to do with *T. angustata*, with which de Mars. associates it, whereas *T. 6-striata* (Dufts.) should have priority.

Tachys fockii (Hümm.) is recorded by Putzeys from Liège: Ann. E. Belg. xiii. c.-r. p. xxx.

Bembidium anglicanum, Shp., is recorded by Bold from Cumberland (Ent. M. M. vi. p. 213), and *B. 4-pustulatum*, Dej., by Gorham from Britain (*ibid.* vii. p. 35). Rye figures the latter, Ent. Ann. 1871, Frontisp. f. 5.

Peryphus sordidus, Kby., = *bimaculatus*, Kby., Lec. Ann. N. H. ser. 4, vi. p. 398; *P. æqualis*, Walk., = *Bembidium planatum*, Lec., Lec. *ibid.* p. 400.

Tachys apristoides and *T. dilatatus*, spp. nn., v. Rottenberg, l. c. pp. 17-18 Sicily.

Bembidium paulinoi, sp. n., v. Heyd., B. E. Z. xiv. Beiheft, p. 63, Coimbra; *B. nobile*, sp. n., Rottenb. l. c. p. 20, Sicily; *B. heterocerum*, sp. n., Thoms., Skand. Col. x. p. 291, Sweden.

Tachypus splendidus, sp. n., v. Heyd. l. c. p. 64, North Spain; *T. curtus*, sp. n., v. Heyd. l. c. p. 65, Valencia, Albufera, Pyrenees.

Anillus corsicus, sp. n., Perris, L'Ab. vii. p. 5, Corsica.

DYTISCIDÆ.

Halipilides.

P. DE BORRE (Ann. E. Belg. xiii. c.-r. p. xxix) records *Haliphus striatus*, Shp., from Belgium, and gives characters for it and its allies.

Haliphus ater, Redt., = *cinereus*, Aubé [= *affinis*, Steph.]: Sch. & Kies., Ins. D. i. H. 2, p. 18.

Haliphus apicalis, sp. n., Thoms., Skand. Col. x. p. 293; *H. transversus*, sp. n., Thoms., Opusc. Ent. fasc. ii. p. 124, Sweden.

Hydroporides.

SCHWARZ (JB. schles. Ges. xlvii. pp. 190-199) enumerates 46 Silesian spp. of *Hydroporus*, giving a table of their vertical distribution. He makes many observations upon Thomson's species.

KRAATZ (B. E. Z. xiv. Beih. p. 66) notes *Hydroporus formosus*, Aubé, from Andalusia, and points out its diagnostic characters, as compared with *H. lepidus*. He corrects the erroneous reference to it as a syn. of *lepidus* in Stein's Cat., and a wrong citation in Olivier's text for the latter; also an erroneous reference of *H. formosus* to Chevrolat by De Marseul. He gives Andalusia and Tangiers as localities for *H. pallidus*, Aubé, and remarks upon the differences between that sp. and *H. confusus*.

V. ROTTENBERG (B. E. Z. xiv. p. 21) notes a Sicilian var. of *Hydroporus geminus* (F.), in which the yellow of the elytra predominates.

Hydroporus minutissimus figured by Rye, Ent. Ann. 1871, Frontisp. f. 6.

THOMSON (Opusc. Ent. fasc. iii. p. 324) redescribes *Hydroporus fuscipennis*, Schaum, from Sweden.

Hydroporus nigrolineatus (Stev.) confounds two species; and *enneagrammus* (Ahr.) must stand: Sch. & Kies., Ins. D. i. 2, p. 83. *H. bohemani*, Thoms., = *nitidus*, Stm., = *oblongus*, Steph., *ibid.* p. 58; *H. gyllenhali*, Schiödt, = *piceus*, Steph. [but Stephens's *piceus* = *rufifrons*, Dufts., *teste* Waterhouse], p. 60; *H. piceus*, Sturm nec Steph., is renamed *fuscipennis*, p. 64 [but if Stephens's *piceus* does not stand this renaming is needless]; *H. geniculatus*, Thoms., = *nigellus*, Mannh.; *H. acutangulus*, Thoms., = *glabriusculus*, Aubé, p. 67, note.

Hydroporus morio, Dej. nec Heer, is named *atriceps*: Crotch, C. H. vi. p. 96.

Oxyoptilus, g. n., Schaum & Kies., Ins. Deutschl., Bd. i. Hälfte 2, p. 22. Claws of post. tarsi equal, mobile; prost. dilated at apex, metast. wide in front; interm. legs far apart; elytra pointed at apex. Sp. *O. cuspidatus* (Kunze); ? *Hydr. pustulatus* (Melsh.) and *H. carbonarius*, Clk. This genus is identical with *Hydrovatus* (Mots., 1853 & 55): *teste* Ballion, Bull. Mosc. xlii. p. 219.

Hydroporus lautus, sp. n., Sch. & Kies. l. c. p. 35, Halle; *H. kraatzii* sp. n., Sch. & K. l. c. p. 66, Glatzer Alps; *H. jucundus*, sp. n., Perris, L'Ab. vii. p. 7, Eaux-Bonnes.

Dytiscides.

P. DE BORRE (Ann. E. Belg. xiii. p. 13 et seq., & c.-r. p. xxiv) adds some observations to his former account of females of *Dytiscus marginalis* with smooth elytra (Zool. Rec. vi. p. 220).

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Trechus heeri, sp. n., Tournier, S. E. Z. xxxi. p. 194, Mt. Sentis, Switzerland, Taf. 1. f. 7.

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Tachypus splendidus, sp. n., v. Heyd. l. c. p. 64, North Spain; *T. curtus*, sp. n., v. Heyd. l. c. p. 65, Valencia, Albufera, Pyrenees.

Anillus corsicus, sp. n., Perris, L'Ab. vii. p. 5, Corsica.

DESB. DES LOGES (L'Ab. vii. p. 97) redescribes his *Berosus corvicius*.

v. HRYDEN (B. E. Z. xiv. Beih. p. 71) observes upon *Limnebius sericatus*, Muls., and *L. evanescens*, Kies. v. KIESENWETTER (*ibid.*) redescribes the latter species.

v. KIESENWETTER (l. c. p. 73) redescribes his *Hydræna exarata*, which he records from Cordova.

New species:—

Hydrobius morenæ, v. Heyd., B. E. Z. xiv. Beiheft, p. 67, Sierra Morena; *H. flavitarsis*, Kirsch, B. E. Z. xiv. p. 337, Bogotá.

Anacæna variabilis, Sharp, Ent. M. M. vi. p. 255, England and Scotland; *A. carinata*, Thoms. l. c. p. 126, Sweden. [These species seem identical, Sharp's apparently having priority.]

Philhydrus agriogeninus, v. Rottenberg, B. E. Z. xiv. p. 22, Sicily; *P. tro-picus*, Kirsch, l. c. Bogotá; *P. wollastoni* and *P. hesperidum*, Sharp, Ann. N. H. ser. 4, v. p. 16, Cape-Verdes.

Laccobius leucaspis, v. Kies. l. c. p. 68, Andalusia, Algiers, Egypt; *L. inter-mittens*, v. Kies. l. c. p. 69, Cordova; *L. subtilis*, v. Kies. *ibid.*, Andalusia, Sicily, Constantinople; *L. viridiceps*, v. Rottenberg, B. E. Z. xiv. p. 23, Sicily.

Limnebius gerhardti, v. Heyd. l. c. p. 70, Brañuelas, Portugal.

Helophorus æqualis, Thoms. Skand. Col. x. p. 300; *H. pallidulus*, Thoms. *ibid.* p. 304; *H. brevicollis*, Thoms. *ibid.* p. 307; *H. strigifrons*, Thoms. *ibid.* p. 308; *H. planicollis*, Thoms. Opusc. Ent. p. 327, Sweden, allied to *H. æneipennis*.

Hydrochus interruptus, v. Heyd. l. c. p. 72, Sierra Guadarrama; *H. gran-dicollis*, v. Kies. l. c. p. 73, Andalusia and Corsica.

Cyclonotum brevitarse, v. Heyd. l. c. p. 74, Galicia.

PAUSSIDÆ.

Trimen's observations at Cape Town on *Paussus burmeisteri*, Westw., and the myrmecophilous *Pentaplatarthrus paussoides*, Westw., are recorded in Pr. E. Soc. 1870, p. iii.

STAPHYLINIDÆ.

Aleocharides.

FAUVEL (L'Ab. vii. p. 136) gives the following synonymy:—*Leptusa exilis*, Perris, = *Homalota cæsula*, Er., *ex typ.*; *H. nitida*, var. *nitidiuscula*, Sharp, = *alpestris*, Heer, *ex typ.*, *nec* Ktz., Scriba [*fide* Sharp in *litt.*]; *H. oblique-punctata*, Woll., = *pavens*, Er. [already published by Sharp]; *H. æneicollis*, Shp., = *waterhousei*, Woll., *ex typ.* [incorrect].

GORHAM (Ent. M. M. vii. p. 136) records *Aleochara maculata*, Bris., from England.

SCRIBA (B. E. Z. xiv. Beih. p. 77) records an immaculate var. of *Aleochara crassiuscula*, Sahlb., from the Sierra de Gerez.

Atemeles reflexus, Walk., = *cavus*, Lec.: Lec., Ann. N. H. ser. 4, vi. p. 400.

Calodera rubens, Er., is recorded as British by Rye, Ent. M. M. vi. p. 229.

Ozypoda longipes, Muls. (? *metatarsalis*, Thoms.) is recorded from Scotland by Sharp, Ent. M. M. vi. p. 281.

Ozypoda nitidiventris, Fairm., = *lateralis*, Sahlb.: Kraatz, B. E. Z. xiv. p. 271.

THOMSON (Opusc. Ent. fasc. ii.) records *Homalota incognita* and *canescens* (Sharp), and (fasc. iii.) *H. cavifrons*, Shp., and *H. eremita*, Rye, from Sweden.—*Homalota subanea*, Shp., = (*Atheta*) *aquatica* (Thoms.): Thoms. *ibid.* p. 130.

SHARP (Ent. M. M. vi. p. 230) notes the identity of Spanish and English spp. of *Homalota*. *H. obliquepunctata*, Wollast., = *pavens*, Er.; *H. pulchra*, Ktz., = *montivagans*, Woll.: Sharp, *ibid.*

BOLD (Ent. M. M. vii. p. 136) proves the priority of *Homalota algæ*, Hdy., over *H. puncticeps* (Thoms.), and considers Hardy's name should be adopted, in spite of the confusion of his insects.

CHAMPION gives localities for 86 spp. of *Homalota* from the London district (Ent. M. M. vi. p. 257).

Actocharis, g. n., Sharp, l. c. (May 1870) p. 279. Ant. and interm. tarsi 4-, post. 5-jointed; eyes obsolete; lab. palpi 2-jointed; 3rd joint of max. palpi inflated, 4th subulate. In some characters allied to *Myllena*, in others to *Gyrophæna*, but nearest allied to *Silusa* (sec. auct.). Sp. *A. readingii*, sp. n., Sharp, *ibid.*, Plymouth (max. and lab. figured). [FAUVEL (Pet. Nouv. 27, p. 108) claims to have described this sp. in 1869, under the name of *A. marina*; but he does not state in what publication, and the Recorder has failed to find any such description or name in that year. Fauvel also states that the insect belongs to the *Oxytelides*, near *Thinobius*, and not to the *Aleocharides*, as Sharp considers. It is to be hoped that he is more accurate in his date than in this utterly erroneous statement. He has found the insect with *Æpis* [sic] at Saint-Vaast-la-Hogue, Manche.]

Piochardia, g. n., v. Heyden, B. E. Z. xiv. Beih. p. 75, Taf. ii. fig. 1. Compared with *Homœusa* by its author, who distinguishes it therefrom chiefly by the more slender penult. joint of its max. palpi, and its short and thick antennæ, this genus is stated by Kraatz (*ibid.* p. 176) to be most closely allied to his *Ozysoma*. No examination appears to have been made of the cibarian organs of the unique exponent of the new genus. Sp. *P. lepismiformis*, sp. n., v. Heyd. *ibid.*, Guarda (Serra Estrella).

New species :—

Ocalea latipennis, Sharp, l. c. p. 280, Scotland.

Leptusa tricolor, Scriba, l. c. p. 75, Serra de Gerez.

Microglotta (*Haploglossa*) *longicornis*, Thoms., Skand. Col. x. p. 317, Sweden.

Aleochara fungivora, Sharp, l. c. p. 280, Scotland; *A. humeralis*, Solsky, Bull. Mosc. xlii. p. 257, Cayenne; *A. anthomyiæ*, Sprague, Amer. Ent. & Bot. ii. p. 370, Boston, U. S. A. (supposed to be parasitic upon *Anthomyia brassicæ*, Bouché, cf. *ibid.* p. 370).

Atemeles siculus, v. Rottenberg, B. E. Z. xiv. p. 24, Sicily.

Myrmedonia mustela, v. Rottenb. l. c. p. 25, and *M. pulla*, p. 26, Sicily; *M. flavicornis*, Solsky, l. c. p. 258, Mexico.

Callicerus clavatus, v. Rottenb. l. c. p. 27, Sicily.

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Calodera glabrata, v. Kies., B. E. Z. xiv. Beih. p. 77, Sierra de Jaen.

Oxyropa temacornis, Scriba, l. c. p. 75, Escorial; *O. determinata*, Scriba, l. c. p. 78, Guarda; *O. gobanzi*, Gredler, C. H. vi. p. 4, Tyrol.

Homalota sharpi, Rye, Ent. M. M. vii. p. 6, England; *H. puberula* [preoccupied by Sharp], Solsky, Bull. Mosc. xlii. p. 259, Mexico.

[*Homalota*] *Atheta ischnocera*, Thoms., Opusc. Ent. p. 183; *A. glabella*, Thoms. l. c. p. 184; and *A. arenicola*, Thoms., Skand. Coll. x. p. 321, Sweden.

[*Homalota*] *Lyprocorrhe nidorum*, Thoms., *ibid.* p. 319, Sweden.

Placusa denticulata, Sharp, l. c. p. 281, Britain.

Oligota ruficornis, Sharp, l. c. p. 282, England.

Tachyporides.

RYE (Ent. M. M. vi. pp. 209–212) abstracts and comments upon Pandellé's monograph of the European spp. of this family, especially as regards those found in Britain; and records *Bolitobius* (*Bryoporus*) *rugipennis*, Pand., from Scotland.

Tachinus berezynicus, Wank., = *nitidus*, Pand., not Fauv.: Fauvel, L'Ab. vii. p. 136 [Zool. Rec. vi. p. 225].

Conosoma cavicola, sp. n., Scriba, B. E. Z. xiv. Beih. p. 79, Andalusia.

Mycetoporus heydenii, sp. n., Scriba, *ibid.*, Escorial; *M. spelæus*, sp. n., Scriba, l. c. p. 80, Asturias; *M. æqualis*, sp. n., Thoms., Skand. Coll. x. p. 323, Sweden.

Quediides.

Acylophorus wagenschieberi. Calix (B. E. Z. xiv. p. 418) gives particulars of capture of this rare species near Berlin.

Quedius, var. *fuchsii* (Scriba) = var. *mesomelinus* (Msh.), *immat.*, ex typ., Fauvel, L'Ab. vii. p. 136 [not a very clear elucidation; the author probably means *temporalis*, Thoms., hitherto deemed dark *fulgidus*, by his last name].

v. ROTTENBERG (B. E. Z. xiv. p. 28), who is apparently not aware of Thomson's dismemberment of *Quedius fulgidus* (F.), very briefly describes, under the name *virens*, a Sicilian form of one of the numerous spp. confused under the former name.

Acylophorus pulcher, sp. n., Scriba, B. E. Z. xiv. Beih. p. 81, Galicia.

Heterothops nidicola, sp. n., Thoms., Opusc. Ent. fasc. ii. p. 127, Sweden.

Quedius robustus, sp. n., Scriba, *ibid.*, Santas Albas, Leon; *Q. cælebs*, v. Rottenb. l. c. p. 28, and *Q. myagrus*, p. 29, Sicily.

Staphylinides.

Staphylinus hesperus, Crotch, = *æthiops*, Waltl: Crotch, C. H. vi. p. 100.

Crepophilus bicinctus (Esch.) = *arcticus*, Er., Solsky, Bull. Mosc. xlii. p. 262; and *C. orientalis*, Mots., is almost certainly identical with it also, Solsky, Hor. Ent. Ross. vii. p. 346.

Staphylinus xanthocephalus and *fulviceps*, Mén., and *S. erythrocephalus*, Mots., = *chrysocomus*, Mann.: Solsky, l. c. vii. p. 348.

Philonthus immutatus, Motsch., = *latiusculus*, Hoch.: Solsky, l. c. vii. p. 349.

Philonthus scutellatus, Mots., Hoch., = *ephippium*, Nordm., which is specifically distinct from *P. punctus* (Gr.): Solsky, Bull. Mosc. xlii. p. 461.

Philonthus cicatricosus, Er., is recorded as British by Moncreaff, Ent. 75, p. 43 (cf. also Crotch, Pr. E. Soc. 1870, p. ii), and figured by Rye in Ent. Ann. 1871, Frontisp. fig. 7.

Belonuchus flavipennis, Mexico, and *B. variolosus*, Cayenne, sp. nn., Solsky, Bull. Mosc. xlii. p. 263.

Staphylinus ussuriensis, sp. n., Solsky, Hor. Ent. Ross. vii. p. 347, Eastern Siberia.

Philonthus mimulus, sp. n., v. Rottenberg, B. E. Z. xiv. p. 30, Sicily; *P. ænescens*, sp. n., Solsky, Hor. Ent. Ross. vii. p. 349, Mexico; *P. velatipennis*, sp. n., Bull. Mosc. xlii. p. 461, Astracan.

Xantholinides.

Xantholinus distans, Muls., is recorded from Scotland by Rye (Ent. M. M. vii. p. 9).

Xantholinus transluceus, sp. n., Scriba, B. E. Z. xiv. Beih. p. 81, Sierra Nevada and Gibraltar.

Metoponcus tricolor, sp. n., Brancsick, B. E. Z. xiv. p. 418, Hungary.

Othius piceus, sp. n., Scriba, l. c. p. 82, Ronda.

Pæderides.

v. ROTTENBERG (B. E. Z. xiv. p. 33) notes a degeneration in Sicilian as compared with Dalmatian specimens of *Doliceon illyricus* (Er.).

Scopæus subcylindricus, Scriba, = *rubidus*, Muls., ex typ.: Fauvel, L'Ab. vii. p. 136.

Dachnochilus latus, Lec., = *angularis* (Er., *Lithoc.*): Lec., Ann. N. H. ser. 4, vi. p. 403.

Sunius neglectus, Märk., is recorded as British by Gorham (Pr. E. Soc. 1870, p. ix).

Ctenomastax, g. n., Kraatz, B. E. Z. xiv. Beih. p. 84. Labrum 8-dentate; 3rd joint of max. palpi clavate, 4th joint scarcely perceptible; two apical joints of the short antennæ very large, forming a club. Seems intermediate between *Sunius* and *Evæsthetus* (*Stenides*). Sp. *C. kiesenwetteri*, sp. n., Ktz. l. c. p. 85, Taf. ii. fig. 4, Seville (cf. B. E. Z. 1865, p. 369).

New species:—

Glyptomerus etruscus, Piccioli, Bull. Ent. Ital. ii. p. 310, Isolotto, Arno (? *G. cavicola*, var. *apenninus*, Baudi).

Lathrobium erythrum, v. Rottenberg, l. c. p. 31, Sicily (= *lusitanicum*, Grav. *ibid.* p. 260); *L. punctatissimum*, Scriba, *ibid.* p. 417, Sicily and Greece.

Lithocharis spelæa, Scriba, l. c. p. 82, Alcoij.

Sunius æmulus, v. Rottenb. l. c. p. 33, and *S. humeralis*, p. 34, Sicily.

Pinophilides.

Ædichirus cedyus [sic], sp. n., v. Rottenb. l. c. xiv. p. 34, Sicily.

Stenides.

BEDEL (L'Ab. vii. p. 92) tabulates the species allied to *S. rano*.

New species :—

Stenus subcylindricus, Scriba, B. E. Z. xiv. Beih. p. 83, Santas Albas; *S. glabellus*, Thomson, Opusc. Ent. fasc. ii. p. 127, and *S. subglaber*, Thoms. l. c. fasc. iii. p. 329, Sweden; *S. oscillator*, Rye, Ent. M. M. vii. p. 7, England; *S. barnevillei*, Bedel, l. c., Fontainebleau (= *longitarsis*, Thoms.: Fauvel, *ibid.* p. 136).

Oxytelides.

V. FRAUENFELD (Verh. zool.-bot. Ges. Wien, xx. p. 60) communicates a letter of A. Stentz, who describes the occurrence of *Bledius tricornis* (Grav.) on the wing in vast multitudes.

Bledius fuscipes, Rye. Taylor notes the habits of this species near Liverpool (Ent. M. M. vii. p. 10).

Platystethus pilosellus, Wank., = *nodifrons* (Sahlb.), *ex typ.*: Fauvel, L'Ab. vii. p. 136.

CZWALINA (B. E. Z. xiv. p. 422) tabulates eight species of *Oxytelus* allied to *depressus*, of which he describes three as new. Scriba (*ibid.* p. 423) briefly refers to the characters of two of the former and of another allied species; and Kraatz (*ibid.* p. 424) repeats Pandellé's description of two more closely allied species,—the latter author's 9 species (in Gren. Cat. &c.) being thus increased to 12.

Oxytelus parvulus, Muls., is a *Trogophleus*: Czwalina, l. c. p. 422.

New species :—

Bledius atramentarius, v. Rottenberg, B. E. Z. xiv. p. 35, and *B. infans*, v. Rott. l. c. p. 36, Sicily.

Oxytelus. Czwalina (l. c.) describes the following new species:—*O. transversalis*, p. 419 (? = *fairmairei*, Pandellé, *teste auct.*); *affinis*, p. 420; *tetratoma*, p. 221; all from Königsberg, taken in company with *O. depressus*, their intimate ally.

Oxytelus carbonellus, Solsky, Bull. Mosc. xlii. p. 246, Mexico.

Trogophleus spinicollis, Rye, Ent. M. M. vii. p. 8, north-west coast of England.

Osorius canaliculatus, Solsky, Bull. Mosc. xlii. p. 265, Mexico.

Compsophilus macellus, Ktz., B. E. Z. xiv. Beih. p. 85, Seville (*cf.* B. E. Z. 1865, p. 369).

Homaliades.

Philorhinum ruficollis, Schaaf. The author redescribes this species (Nunq. Otios. p. 38).

British examples of *Homalium heerii*, Heer, = *vile*, Er., var., Heer's insect itself being probably only that species, *teste* Rye (Ent. M. M. vii. p. 152), who corroborates *H. brevicorne*, Er., as British, and remarks upon its differences from *H. gracilicorne*, Fairm., and *H. vile* (*ibid.* p. 153).

Anthobium torquatum, Ktz., *nec* Marsh., is named *collaris*: Crotch, C. H. vi. p. 101.

Lesteva corsica, sp. n., Perris, L'Ab. vii. p. 8, Corsica.

Coryphium gredleri, sp. n., Kraatz, B. E. Z. xiv. p. 417, Tyrol.

Piestides.

Lispinus rufescens, Lec., belongs to *Ancæus* (Fauv.): Lec. Ann. N. H. (4) vi. p. 403.

Glyptoma punctatoplicatum, sp. n., Solsky, Bull. Mosc. xlii. p. 267, Cayenne.

PSELAPHIDÆ.

Ctenistes staudingeri, Schaaf. The author redescribes this species (Nunq. Otios. p. 38).

Bryaxis rubra, Mots., nec Aubé, is renamed *melina*: Solsky, Bull. Mosc. xlii. p. 462, (?=*chevrieri*, Aubé). *Bythinus bajulus*, Hampe, = *femoratus*, Aubé: Solsky, l. c. p. 463.

New genera:—

Decatocerus. With the curt note, "*Bythinorum characteres, sed antennæ 10-articulate*," de Saulcy, B. E. Z. xiv. Beih. p. 89, describes, under the name of *D. alhambrae*, a new species from the Alhambra, taken by Dieck. It is figured on tab. ii. fig. 7.

WESTWOOD, Tr. E. Soc. 1870, characterizes the following new genera and species:—

Goniastes, p. 125. Antennæ 5-jointed, geniculate. Sp. *G. sulcifrons*, p. 126, Ega, Amazons.

Rhytus, p. 126. Palpi nearly obsolete. Sp. *R. vestitus*, *ibid.*, Brazil.

Curculionellus, p. 127. Facies of *Pselaphus*, but head rostrate, palpi much shorter, and abdomen margined. Sp. *C. glabricollis*, p. 127, and *C. doreianus*, p. 128, New Guinea; *C. angulicollis*, p. 127, Cape York.

Sathytes, p. 128 (no diagnostic observations made). Sp. *S. punctiger*, *ibid.*, Borneo.

Pselaphodes, p. 129. Allied to *Curculionellus*, but villose above and tarsi biunguiculate. Sp. *P. villosus*, *ibid.*, Borneo.

Sintectes, *ibid.* Palpi spinose. Sp. *S. carinatus*, p. 130, Australia.

Phalepsus, p. 131 (no diagnostic observations made). Sp. *P. subglobosus*, *ibid.*, Amazons. (Indications of another species, provisionally named *batesellus*, are given.)

Rhyxabis [qu. *Ryxabis*, anagram of *Bryaxis* ?], *ibid.* (no diagnostic observations made). Sp. *R. anthicoides*, p. 132, Singapore.

New species:—

Ctenistes andalusicus, de Saulcy, l. c. p. 86, Cordova.

Pselaphus. De Saulcy, l. c., describes the following species:—*P. piochardi*, p. 86, Serra de Gerez, Port.; *heydenii*, p. 87, tab. ii. fig. 5, Santa Albas, Leon; *algisiranus*, *ibid.*, Algesiras; *dieckii*, *ibid.* tab. ii. fig. 6, Zumarraga.

Faronus hispanus, de Saulcy, *ibid.*, Algesiras.

Trichonyx brevipennis, de Saulcy, l. c. p. 88, Algesiras.

Tychus miles and *T. armatus*, De Saulcy, *ibid.*, Malaga.

Batrissus schwabii, Reitter, B. E. Z. xiv. p. 212, t. i. f. 7, Paskau (and Spandau, Ktz.).

Bryaxis rufula, v. Rottenberg, B. Z. xiv. p. 37, Sicily; *B. coronatus* and *auritulus*, Westw. l. c. p. 130, Brazil.

Bythinus. De Saulcy, *l. c.*, describes the following species:—*B. ibericus*, p. 88, Algesiras; *lusitanicus*, *ibid.*, and *nasicornis*, p. 89, Serra de Gerez; *troglucerus*, p. 89, Escorial; *peninsularis*, *ibid.*, Algesiras.

Bythinus glabratus, Rye, Ent. M. M. vii. p. 33, south coast of England.

Euplectus richteri, Reitter, *l. c.* p. 215, t. i. f. 6, Paskau (and Berlin, Ktz.).

SCYDMÆNIDÆ.

MOTSCHOULSKY (Bull. Mosc. xlii. pp. 252–272, tab. viii. 12) supplements his enumeration published in 1851. He gives the following synonymy:—*Microstemma lapidaria*, Mots., = *tarsata* (M. & Kunze) ♀; *Cyrtoscydmus obscuricornis*, Mots., = *punctipennis* (Steph.); *C. vernalis*, Mots., = *chevrieri* (Heer); *C. spinimanus*, Mots., = *pusillus* (M. & Kz.) ♂; *C. collaris*, var. (Chaud.), = *longicollis*, Mots.; *Scydmænus gibbulus*, Mots., = *pumilio*, Schaum; *S. exilis*, Schm., = *nanus*, Märk.; *S. helveticus*, Lec., = *clavicornis*, Mots.; *S. hirticollis* (Ill.) = *minutus* (F.); *Ægialites* (Mann., 1853) = *Elosoma* (Mots., 1845); and *E. persica* (Mots.) comes from Russian America, and = *californica*, Mots., ♀, which has nothing to do with *debilis* (Esch.). The author figures the cibarian organs of *Mastigus palpalis*, *Leptoderus hovenwarthii*, *Syndicus pilicornis*, *Tetrameus pubicollis*, *Eumicrus rufus*, *Microstemma tarsata*, *Cyrtoscydmus godarti*, *collaris*, and *scutellaris*, *Scydmænus angulatus*, *claviger*, and *hirticollis*, *Cephennium intermedium*, and *Euthia plicata*.

DE SAULCY (*l. c.* p. 90, note) considers that *Scotodytes*, associated with his new genus *Orodytes* (from Corsica), should form a separate group, under the name *Scotodytidæ*.

Leptonotus, g. n., Mots. *l. c.* p. 253. More oval than *Leptoderus* (Schm.), with rather wider head and thorax, but narrower elytra, which are more rounded at apex, as in *Pholeon*, only connate, and with no scutellum. Ant. tarsi pentam. in ♂, tetram. in ♀. Eyeless and wingless. No antennal club. Sp. *L. sericeus* (Schm., *Leptod.*).

Tetrameus, g. n., Mots. *l. c.* p. 257 (*Scydmænus*, auct., *partim*. No compar. diagn. given). Sp. *T. oblongus* (Stm.), *pubicollis* (Müll. et K.), *agilis* and ? *transversicornis* (Mots.), *styriacus* (Grimm.), *rufulus* (Chaud.).

Cyrtoscydmus, g. n., Mots. *l. c.* p. 260. Comprises such of the *Scydmæni* as have narrow, indistinctly toothed, falciform mandibles, feebly clavate antennæ, and apterous females; and, compared with the author's true *Scydmænus*, a generally less angular form, more strongly punctured and more evenly pubescent surface; a cordate thorax, more convex in front, with large basal foveolæ, and ant. tibiae more or less triangularly dilated. The well-known *S. godarti* (Latr.), *scutellaris*, and *collaris* may be taken as types of this genus (of which the author enumerates 26 species), which is equivalent to Erichson's first group.

New species:—

Scydmænus. De Saulcy, *l. c.*, describes the following new species:—*S. angustior*, *lusitanicus*, and *hematodes*, p. 90, Serra de Gerez; *laticeps*, Mada de Bussaco and Serra de Gerez, *distinguendus*, Serra de Gerez, *heydeni*, Cea, Serra Estrella, p. 91; *alcides* and *hospes*, Algesiras, *cordubanus*, Sierra de Cordoba, *ædicerus* and *navaricus*, Zumarraga, p. 92.

Scydmænus ventricosus, Rottenberg, B. E. Z. xiv. p. 38, Sicily.

Scotodytes diecki, de Saulcy, l. c. p. 90, Taf. ii. fig. 2, Zumarraga.

Cephennium (*Geodytes*) *pygmæum*, de Saulcy, l. c. p. 93, Sierra de Cordoba; *C. (G.) atomarium*, de S. *ibid.*, Zumarraga; *C. bicolor*, De S. *ibid.*, Tangiers.

Mastigus heydenii, v. Rottenb. l. c. p. 233, Naples.

SILPHIDÆ.

Leptoderides.

Spekæochlamys, g. n., Dieck, B. E. Z. xiv. Beih. p. 93. Intermediate between *Drimeotus* (Mill.) and *Adelops* (Telk.). Eyeless; ant. tarsi 4-jointed; mesost. with an elevated keel in the middle, produced into a denticle in front; thorax narrower than elytra, narrowed from base to apex, post. angles impressed, reflexed, very sharp; lateral margin of elytra widely reflexed. Sp. *S. ehlersi*, sp. n., Dieck, l. c. p. 94, Alicante.

Silphides.

Necrophorus melsheimeri, Lec. nec Kby., = *obscurus*, Kby.; *N. melsheimeri*, Kby., *lunatus*, Lec., = *sayi*, Lap.; *N. maritimus*, Mann., = *hebes*, Kby.; *N. defodiens*, Mann., = *pygmæus*, Kby.: Lec., Ann. N. H. ser. 4, vi. p. 398. *N. conservator*, Walk., = *pollinator*, Lec.; *N. pollinator*, Mann., = *maritimus*, Mann., var.: Lec., *ibid.* p. 400.

PETTITT (Canad. Ent. ii. p. 20) records *Necrophilus subterraneus* (F.) as frequenting decomposing fungus at Ontario.

RYE (Ent. M. M. vi. p. 182) refers to Michow's observations on *Necrophorus ruspator*, Er., and *N. microcephalus*, Thoms.; and (vii. p. 9) records *Colon denticulatum*, Ktz., from England.

Adelops adnerus, Schaaf. Dieck, B. E. Z. xiv. p. 191, corrects an error as to the locality for this species (cf. Kraatz, *ibid.* p. 192).

SCHAUFUSS (Nunq. Otios. pp. 33-37) redescribes his *Adelops erberi* and *A. pruinosis*, and enters into some details as to his suppressed genera *Quæstus* and *Quæsticulus*.

KRAATZ (B. E. Z. xiv. Beih. p. 96, note) repeats his opinion that *Catops* and *Choleva* form distinct genera. He enumerates 5 recorded spp. of *Catops* from South Spain, records *Colon murinum*, Ktz., from Algesiras (p. 97, note), mentions 3 recorded species of *Choleva* from South Spain, and briefly recharacterizes *C. notaticollis*, Baudi, p. 101, note.

Myrmecophihus (Motsch., 1844) is changed to *Attephihus* and recharacterized, *Catopsimorphus pilosus*, Muls., being referred to it, as well as *A. paradoxus*, Mots. Motschoulsky, Bull. Mosc. xlii. p. 350.

Catopocerus, g. n., Mots. l. c. p. 351. Intermediate between *Catops* and *Agyrtes*, having a shining surface, as in the latter, and the antennæ as in the former; legs rather evidently dilated. Sp. *C. politus*, sp. n., Mots. *ibid.*, North America.

New species :—

Necrophorus ruficornis and *N. plagiatus*, Mots. l. c. p. 352, California.

Oiceoptoma cyaniventris, Mots. l. c. p. 348, and *O. obscuriventris*, Mots. l. c. p. 349, East Indies.

Adelops sarteanensis, Bargagli, Bull. Ent. Ital. ii. p. 175, Mt. Cetona.

Catops andalusicus, v. Heyden, B. E. Z. xiv. Beih. p. 95, and *C. vandaltiae*, v. Heyd. l. c. p. 97, Ronda; *C. rufus*, Ktz. l. c. p. 93, Carthagena and Alexandria.

Choleva. Kraatz (l. c.) describes the following new species:—*C. angusticollis*, p. 98, and *gracilis*, p. 99, Cordova; *græca*, ibid. note, Greece; *costatula*, p. 100, note, Algiers.

Choleva exigua, Kirsch, B. E. Z. xiv. p. 354, Bogotá.

Catopomorphus bicolor, Kraatz, l. c. p. 102, Jaén and Cordova; *C. myrmecobius*, v. Rottenberg, B. E. Z. xiv. p. 39, Sicily.

Anisotomides.

Hydnobius andalusicus, sp. n., Dieck, B. E. Z. xiv. Beih. p. 102, Algesiras.

Anisotoma similata, sp. n., Rye, Ent. M. M. vii. p. 8, England.

Liodes raffrayi, sp. n., v. Heyden, B. E. Z. xiv. Beih. p. 103, Sierra Guadarrama and Banat, Hungary.

Agathidium nudum, sp. n., Hampe, B. E. Z. xiv. p. 333, Croatia.

TRICHOPTERYGIDÆ.

MATTHEWS (Ent. M. M. vii. p. 152) records *Ptenidium intermedium*, Wank., which (as possibly clashing with *Trichopteryx intermedia*, Gillm.) he renames *vankowiezii*. Wilkinson (*ibid.*) records his capture of this species at Scarborough.

SCAPHIDIADÆ.

Scaphidium amurense, sp. n., Solsky, Hor. Ent. Ross. vii. p. 350, Siberia.

Cyparium sibiricum, sp. n., Sols. *ibid.*, Irkoutsk, Siberia.

HISTERIDÆ.

DE MARSEUL (Ann. E. Belg. xiii. p. 65 *et seq.*) reproduces the descriptions of certain species by Motschulsky (Bull. Mosc. 1863), Leconte (New Spec. of Col. 1863), and Kirsch (B. E. Z. 1866), also Perroud's description of *Platysoma montrouzieri* (for which he proposes the name *perroudi*, if it be distinct from the closely allied *Apobletes montrouzieri*). *P. ceylonicum*, Mots., = *motschulskyi*, Mars.; *P. semistriatum*, Mots., = *birmanum*, Mars., *sec. typ.*; *P. marseuli*, Caud., = *odiosum*, Mars., with which *dissimile*, Mots., is also most probably identical. *Phehister affinis*, Lec., = *solator*, Mars. He redescribes *Paromalus parallelus* (Lec.), and justifies his change of that name to *laterirectus*; describes (p. 112) *Saprinus strobili* [under his own name, instead of that of Steinheil, who first published it]; gives a synoptical table, with localities, of the known spp. of *Paromalus* (pp. 103–108); and, pp. 126–136, a supplement to his own Cat. of *Histeridæ*, published in Ann. Soc. Ent. Fr., Nov. 1862.

DE MARSEUL (Nouv. et faits div. p. xi) enumerates some interesting spp. from Montevideo, with indications of 6 new spp.

DOHRN (S. E. Z. xxxi. p. 334) defends the reading *Tryponæus* for Eschscholtz's genus.

Saprinus consimilis, Walk., = *oregonensis*, Lec.: Lec., Ann. N. H. ser. 4, vi. p. 400. [*H*] *Omalothes texanus* = (*grossus*, Mars.), *Hololepta excisa*, *Platysoma cylindroides*, *Hister cavifrons*, *H. californicus*, and *Epierus coproides* of Mar-

seul should apparently not be quoted from the United States: Lec., *ibid.* p. 403.

DR MARSEUL (Ann. E. Belg. xiii.) characterizes the following new genera and species:—

Dimalus, p. 55. Evidently carnivorous, though subcortical by its build; mandibles very robust, pointed, each armed internally with a bifid tooth, which fits into that of the opposite side. Allied to *Phylloma* (Er.), but with the maxillæ inserted at the back of the mentum. Sp. *D. platamodes*, p. 57, Cayenne.

Operclipygus, pp. 75 & 76. This bastard name is indirectly proposed by the author as that of a genus, the characters of which are mainly deduced from the description of the species on which it is meant to be founded. Comes between *Platysoma* and *Cylistix*, having the facies of the former, but with the pygidium elevated and surrounded by a deep circular furrow. Sp. *O. sulcistrius*, *ibid.*, Amazons.

Mecistostethus, pp. 123, 124. Another new genus of which the characters are to be deduced chiefly from the description of its single species. Resembles *Homalopygus* and *Spathonchus*, but with piliferous punctures on the frons, an antennal depression in the prosternum, a conical mesosternum, metasternum of excessive length, &c. Sp. *M. pilifer*, *ibid.*, Amazons.

Phylloma maragnoni, p. 57, and *P. monodon*, p. 58, Amazons.

Hololepta vulpes, p. 58, Mexico; *H. pygollissa*, p. 59, Panama.

Lioderma cimex, Brazil, and *L. funebria*, Chili, p. 60.

Trypanæus bisulcifrons, p. 61, *T. nasicornis*, p. 62, and *T. resectus*, p. 63, Amazons; *T. sulcipygus*, p. 62, Bahia.

Apobletes fossistoma, p. 63, interior of South Africa; *A. malaccensis*, p. 64, Malacca; *A. subridens*, p. 65, Amazons.

Platysoma striatipectus, p. 67, Melbourne; *P. steinheli*, p. 68, Java; *P. bifossopygum*, p. 69 (no loc. given); *P. levipygum* and *P. 5-striatum*, p. 70, Ceylon; *P. completum*, p. 71, Pine Mountains, Australia; *P. clarenciæ*, p. 72, Clarence R., Australia; *P. strangulatum*, p. 73, and *P. georgii*, p. 74, Port George, Australia.

Pachycræus burmeisteri, p. 76, Brazil.

Phelister kerga, Amazons, and *P. fulvulus*, Buenos Ayres, p. 77; *P. confusaneus*, p. 78, Brazil; *P. muscicapa*, Monte Video, and *P. chilicola*, Chili, p. 79; *P. arzei*, p. 80, Pampas; *P. dregei*, p. 81, Cape of Good Hope (should form at least a subdivision of the genus, *teste* Mars.).

[*H*] *Omalodes lineiger*, p. 82, Amazons.

Psiloscelis castelnaudi, p. 83, Ceylon (gen. dub.).

Contipus platanus, p. 84, Buenos Ayres.

Hister schieri, p. 84, Birmah; *H. denysi*, p. 85 (no loc. given); *H. apis*, p. 86, Caffraria; *H. concordans*, p. 87, Deccan; *H. pioti*, p. 88, Amazons; *H. relictus*, p. 89, N. America.

Epiurus epulo, p. 98, Amazons; *E. sphaerula*, p. 90, Bolivia; *E. axillaris*, p. 91, Paramaribo; *E. rhinoceros*, p. 92, Chili; (? *E. parra*, p. 92, Australia (the author dubiously indicates his belief that this species is not an *Epiurus*, and suggests the name *Stictostix* for the genus which any future describer with more confidence than himself may establish for it).

Carcinops currax, p. 93 (? Algeria); *C. tristiculus*, Brazil, and *C. mayeti*, Egypt and Marseilles, p. 94.

Paromalus biarcus, Ceylon, and *P. forestieri*, New Caledonia, p. 96; *P. umbilicatus*, Sydney, and *P. victoriæ*, Victoria, p. 97; *P. khongius*, Cambodia, and *P. miliaris*, Australia, p. 98; *P. oculipygus*, Monte Video, and *P. rugigenius*, Amazons, p. 99; *P. concentricus*, p. 100, America; *P. hispaniolæ*, Cuba, and *P. bicinctus*, Brazil, p. 101.

Notodoma bullatum, p. 108, Siam, Bangkok, Malacca.

Phylloscelis arechavaletæ, p. 109, Monte Video.

Saprinus dussaulti, p. 110, Assam; *S. æneolus*, Shanghai, and *S. subdiptychus*, Mexico, p. 111; *S. semiosus*, Chili, and *S. libanicola*, Lebanon, p. 113; *S. argentinus*, p. 114, Monte Video; *S. flaviclava*, Amazons, and *S. eremita*, Pampas, p. 115; *S. emys*, p. 116, America; *S. grandini*, p. 117 (no loc. given); *S. ripicola*, p. 118, river Murray, Australia; *S. bicirculus*, South America, and *S. limatus*, Monte Video, p. 119.

Teretrius intrusus, p. 120, East Indies; *T. melburnius*, p. 121, Victoria, Melbourne, Sydney.

Homalopygus longipes, p. 122, Amazons.

Plegaderus monachus, p. 124, South America.

Acrilus hædillus, p. 125, Australia.

PHALACRIDÆ.

PERRIS (L'Ab. vii. p. 35) considers the vermiform larvæ found by F. Loew in blossoms of *Podospermum* as belonging to a *Chironomus* (Dipt.), and not, as supposed, to *Olöbrus bicolor*. The same author (Ann. Soc. Ent. Fr. 4^e sér. ix. pp. 464-466) supplements and corrects the observations of Heeger and Laboulbène upon the larva of *Olöbrus affinis*, and records his own experiences as regards the larvæ of *O. anthemidis*, *millefolii*, *particeps*, and *pygmaeus*.

Phalacrus tropicus, sp. n., Kirsch, B. E. Z. xiv. p. 354, Bogotá.

Olöbrus castaneus, sp. n., Baudi, B. E. Z. xiv. p. 49, Beyrouth; *O. anthemidis*, sp. n., Perris, L'Ab. vii. p. 9, Mont de Marsan.

NITIDULIDÆ.

PERRIS (L'Ab. vii. p. 36) notes the larvæ of *Brachypterus linariæ* as feeding on flowers of *Linaria striata*, and those of *B. cinereus* on flowers of *L. supina* and *L. spartea*; and thinks Kaltenbach most probably wrong in stating that the larva of *B. gravidus* feeds on capsules of a *Linaria*.

SOLSKY (Bull. Mosc. xlii. p. 467) shows by dates of publication that *Nitidula elegans*, Stierl., = *regalis*, Zoubk., = *fusula*, Gebl., which should be used (cf. Zool. Rec. vi. p. 237).

BAUDI (B. E. Z. xiv. p. 50, note) records *Pria pallidula*, Er., from flowers of *Chamæropis humilis* in Sardinia.

Meligethes fulvipes, *rotundicollis*, *bidens*, and *bidentatus*, Bris., *M. brunnicornis*, *viduatus*, and *ovatus*, Stm., and *M. pedicularius* (Gyll.) are recorded as British by Rye, Ent. M. M. vii. pp. 257, 282, & 283.

Gorham (Ent. M. M. vii. p. 156) notes the food-plants of various British species of *Meligethes*.

A var. of *Meligethes lumbaris*, Stm., is described and named *marginata* by Gredler, C. H. vi. p. 7, Tyrol.

Meligethes œneus. Von Frauenfeld (Verh. z.-b. Ges. Wien, xx. pp. 235-236) records destruction caused to cruciferous plants by this species.

VON KIESENWETTER (B. E. Z. xiv. Beih. p. 104, note) objects to his *Xenostrongylus arcuatus*, from Middle Italy, being sunk as a synonym of the Madeira *X. histrio*, Woll.

E. A. Waterhouse records capture in oak-fungus in Yorkshire of *Rhizophagus cribratus* in plenty (Ent. M. M. vi. p. 259).

Rhizophagus vagæ, Wancowicz, = *puncticollis*, Sahlb. : Ktz., B. E. Z. xiv. p. 231.

Brachyleptus, g. n., Motschoulsky, Bull. Mosc. xlii. p. 352. Allied to *Brachypterus*, but with simple hooks to the tarsi. Sp. *B. tinctus* (Mann, *Strongylus*).

New species :—

Meligethes ventralis, Baudi, l. c. p. 50, note, Piedmont.

Xenostrongylus truncatus, v. Kiesnw. l. c., Andalusia.

Cybocephalus metallicus, Baudi, l. c. p. 51 (and var. *seminulum*, p. 52), Asia Minor.

Cryptarcha bifasciata, Baudi, l. c. p. 52, Cyprus.

Rhizophagus punctiventris, Baudi, l. c. p. 53, note, Sardinia.

COLYDIADÆ.

V. HEYDEN (B. E. Z. xiv. Beih. p. 106) refers to the geographical distribution of *Tarphius*.

Schaufuss (Nunq. Otios. p. 46) redescribes his *Anommatus pusillus*.

Hiketes thoracicus, King, = *Nepharis alata*, Casteln. : Pascoe, Pr. E. Soc. 1870, p. v.

The larvæ of a *Colydium* are recorded by Gillman (Amer. Ent. & Bot. ii. p. 240) as boring in beech-wood. Riley notes that the borings very closely resemble those of *Tomicus materiarius* (Fitch) [on which it is to be presumed the *Colydium* is parasitic].

Cyprogenia, g. n., Baudi, B. E. Z. xiv. p. 54. Facies of *Holoparamesus*, but head small, produced in front, thorax narrower in front, and altogether duller. Sp. *C. denticulata*, sp. n., Baudi, *ibid.*, Cyprus.

Tarphius kiesewetteri, sp. n., v. Heyd. l. c. p. 105, Serra de Gerez.

Bothrideres interstitialis, sp. n., v. Heyd. l. c. p. 107, Escorial and Serra de Gerez.

Monotoma sericella, sp. n., v. Rottenberg, B. E. Z. xiv. p. 237, Sicily ; *M. 4-dentata*, sp. n., Thomson, Opusc. Ent. fasc. iii. p. 333, and *M. parallela*, sp. n., Thoms. *ibid.* p. 334, Sweden.

CUCUJIDÆ.

Æraphilus nasutus, Chev., = *fibulatus*, Ktz. ? : v. Rottenberg, B. E. Z. xiv. p. 236.

Æraphilus carpetanus, sp. n., v. Heyd., B. E. Z. xiv. Beih. p. 108, Sierra Guadarrama.

CRYPTOPHAGIDÆ.

PERBIS (Nouv. et faits div. p. ix) records the capture of *Bombus montanus*

on a flower, with a ♀ of *Antherophagus nigricornis* attached by the mandibles to one of its antennæ, and suggests that the beetle had fastened itself on the bee so as to be carried to the nest of the latter, in which it would deposit its eggs. SEIDLITZ (*ibid.* p. lxii) adduces other recorded instances.

BAUDI (B. E. Z. xiv. p. 56, note) records a black var. of *Cryptophagus pilosulus* Gyll., from Piedmont.

Cryptophagus vini, Er., = *Paramecosoma pilosula*, Er.: Thoms., Skand. Col. x. p. 66.

Cryptophagus validus, Ktz., is recorded as British by Rye, Ent. M. M. p. 9; and *C. fumatus*, Gyll., by Bold (*ibid.* p. 35), from Northumberland.

Hypocoprus lathridioides, Mots. Perris, l. c. p. x, records this sp. from France, Algeria, Corsica, and Prussia. Bonnaire (Pet. Nouv. 26, p. 103) notes it from the Island of Ré, found in dried asses' dung.

[*Atomaria*] *Anchicera mesomelas*, var. *d*, Thoms., = *berolinensis* (Ktz.); *A. fuscata*, var. *b*, Thoms., = *basalis* (Er.); *A. salicicola* (Ktz.) ? = *zetterstedti* (Zett.): Thoms. l. c. p. 72 *et seq.*

Henoticus, g. n., Thoms. l. c. p. 67. Allied to *Cryptophagus*, but prosternal process acuminate behind, margined on each side; no callosity to ant. angles of prothor.; penult. joint of tarsi abruptly narrower and shorter than preceding joints. Sp. *H. serratus* (Gyll., *Crypt.*); ? (*C.*) *crenatus* (Gyll., *nec* Thoms., Sk. Col. v. p. 263, which is *bicolor*, Sturm).

Atomaria hiemalis, sp. n., Baudi, l. c. p. 56, note, Piedmont; *A. clavicornis*, sp. n., p. 57, Maritime Alps; *A. puncticollis*, sp. n., Thoms. l. c. p. 69, Sweden.

Epistemus ventrosus, sp. n., Baudi, l. c. p. 57, Syria.

LATHRIDIIDÆ.

Lathridius constrictus, Gyll., is recorded from Britain by Rye (Ent. M. M. vi. p. 283), who makes some general observations on erroneous references of other spp. to Britain by continental authors.

Lathridius nodifer, Westw., is referred by Thomson (Skand. Col. x. p. 54) to his genus *Coninomus*, and *L. elongatus*, Curt., to his *Cartodere* (l. c. p. 55).

BETHE (S. E. Z. xxxi. p. 328) notes the extension of *Lathridius nodifer*, Westw., to Stettin in 1869.

Corticaria fulva, Mann. ?, = *hirtella*, Thoms.: Thoms. l. c. p. 59.

Corticaria baicalica, Mann., = *rubripes*, Mann.: Solsky, Hor. Ent. Ross. vii. p. 352.

BAUDI (B. E. Z. xiv. p. 61) describes, under the name *cypria*, a var. of *Corticaria fulva*, Com.

Revelieria, g. n., Perris, L'Ab. vii. p. 12. Comes between *Dasycerus*, of which it has the convex form, and *Lathridius*, to which it is most nearly allied (no diagnostic characters given). Sp. *R. spectabilis*, sp. n., Perris, *ibid.*, Corsica.

Entoxylon, g. n., Ancey, L'Ab. vii. (1870) p. 84. Allied to *Mycetæa*, but with its antennæ not clavate, and no prothoracic longitudinal impression. Sp. *E. abellei*, sp. n., Ancey, Nouv. et faits div. p. viii (Oct. 1869) and L'Ab. vii. p. 85, Ste. Baume (Var) [*cf.* Zool. Rec. vi. p. 238].

New species :—

Langelandia exigua, Perris, l. c. p. 9, and *L. incostata*, Perris, l. c. p. 11, Corsica.

- Merophysia foveolata* and *M. minor*, Baudi, l. c. p. 59, Cyprus.
Holoparamesus saulcyi, Baudi, l. c. p. 60, Cyprus.
Conithassa (Lathridius) brevicollis, Thoms. l. c. x. p. 56, Sweden.
Enicmus (Lathr.) crenicollis, Thoms. l. c. p. 57, and *E. fungicola*, Thoms. l. c. p. 336, Sweden.
Lathridius tremule, Thoms. l. c. p. 335, Sweden (= *angusticollis*, Redt.).

MYCETOPHAGIDÆ.

- Triphyllus ruficornis*, Lec., = *concolor* (Kby.), of which *humeralis* (Kby.) is a pale example: Lec., Ann. N. H. ser. 4, vi. p. 398.
Litargus trifasciatus, Woll., = *coloratus*, Rosenh.: Crotch, C. H. vi. p. 101.
Typhæa umbrata, sp. n., Baudi, B. E. Z. xiv. p. 62, note, Piedmont.

THORICTIDÆ.

- Thorictus dispar*, sp. n., Baudi, *ibid.* p. 58, Cyprus.

DERMESTIDÆ.

Dermestes mustelinus, Er., infests the nests of *Cnethocampa pityocampa* and *D. lardarius*, *lanarius*, and other spp. the cocoons of *Bombyx mori*. Gredler, C. H. vi. p. 8, and note.

PERRIS (L'Ab. vii. p. 35) considers that the larva of *Dermestes frischii* found by F. Loew in cork did not live upon that wood, but was an attendant upon Lepidopterous larvæ naturally feeding on it.

BAUDI (B. E. Z. xiv. p. 63) records vars. of *Attagenus pæcilus*, Germ., from Asia Minor and Sardinia.

PERRIS (Ann. Soc. Ent. Fr. 4^e sér. ix. p. 468) records the larvæ of *Attagenus piceus* and *Athrenus pimpinellæ* found in winter time in swallows' nests.

GRENIER (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. viii) records the larvæ of *Trenas serra* as devouring the eggs of *Liparis dispar*. The larva of another insect, apparently an *Attagenus*, was also observed by him under similar circumstances.

Cryptorhopalum pilosum and *C. truncatum*, spp. nn., Kirsch, B. E. Z. xiv. p. 355, Bogotá.

Megatoma rufovittata, sp. n., Abeille de Perrin, Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xlv, Var, Vaucluse.

BYRRHIDÆ.

LABOULBÈNE (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. lxxi) notes large numbers of *Nosodendron fasciculare* found in a jelly-like substance peculiar to elm trees.

Byrrhus concolor, Kby., is a *Cytilus*; *B. picipes*, Kby., = *geminatus*, Lec.: Lec., Ann. N. H. ser. 4, vi. p. 398.

v. HEYDEN (B. E. Z. xiv. Beih. p. 108) briefly recharacterizes *Morychus metallicus*, Chev., and *M. transsylvanicus*, Suffr., which, contrary to the opinion of Chevrolat, he considers to be distinct species.

Syncalyptra syriaca, sp. n., Baudi, B. E. Z. xiv. p. 63, Cyprus.

Morychus piochardi, sp. n., v. Heyd. l. c. p. 109, Sierra Nevada and Serra Gerez.

Limnichus murinus, sp. n., Baudi, l. c. Cyprus.

PARNIDÆ.

v. HEYDEN (B. E. Z. xiv. Beih. p. 112) reproduces the description of *Elmis carinatus*, Perez.

BOLD (Ent. M. M. vii. p. 35) publishes Crotch's redescription of *Hydrochus* [!] *parumoculatus*, Hardy, which appears to be closely allied to *macronychus*, though its antennæ are 11-jointed. No further light is thrown on the question of its true geographical locality.

Elmis perezii, sp. n., v. Heyd. l. c. p. 110, Serra de Gerez.

HETEROCERIDÆ.

Heterocerus funebris and *flavescens*, Schauf. The author redescribes these spp. (Nunq. Otios. pp. 39 & 40), affirming the distinctness of the latter from *flavidus* (Rossi) and *hamifer*, Géne.

v. KIESENWETTER (B. E. Z. xiv. Beih. p. 112, note) records Spanish localities for *Heterocerus holosericeus*, Rosenh., and (p. 113) redescribes *H. funebris*, Schauf.

Heterocerus senescens, sp. n. (cf. Kies. B. E. Z. 1865, p. 368), v. Kies. l. c. p. 112, Almuradiel, Seville.

LUCANIDÆ.

Chiasognathides.

Chiasognathus mniszeehii, Thoms., = *jousseini*, Reiche; *Sphenognathus albofuscus*, Blanch., = *prionoides*, Buq.; *Lamprina nigricollis* and *sumptuosa* (Hope) = *micardi*, Reiche: Parry (Tr. E. Soc. 1870, p. 53 *et seq.*), who figures (pl. 1. f. 6) *Chiasognathus latreillii* (Sol.) ♂.

Chiasognathus impubis, sp. n., Parry, l. c. p. 68, pl. 1. f. 5, Chili (♀ *C. latreillii*, Sol., var. *max.*).

Sphenognathus walsi, sp. n., Taschenberg, Z. ges. Naturw. 1870, Bd. i. p. 178, Ecuador.

Lucanides.

MOTSCHOULSKY (Bull. Mosc. xliii. p. 18 *et seq.*) discusses the question as to the specific value of certain members of *Lucanus*, particularly as regards Kraatz's views on the point. His own opinions are apparently in favour of a number of distinct species, which he divides into three sections, characterized respectively by the club of their antennæ being composed of 4, 5, or 6 joints. He describes some as new, and considers Kraatz wrong in uniting certain forms by intermediate links and in regarding individuals taken in copulâ as belonging to the same species. He describes (with some external detail in outline, pl. ii.) the following spp. as distinct:—*L. cervus*, L., *carpa* [sic], Ol., *maxillaris*, Mots., from the Crimea, Hungary, &c.; *europæus*, sp. n., l. c. p. 30, t. ii. f. 4, Kharcov; *reichei*, sp. n., p. 31, f. 5, Toulouse, queried as possibly *pentaphyllus*, Reiche; *tauricus*, Mots., Crimea; *brevicollis*, sp. n., l. c. p. 34, f. 7, Voronège, S.E. Russia in Europe; *fabiani*, Muls., of which he thinks *impressus*, Thunb., may be the ♀, *turcicus*, Sturm, *piger*, presumably sp. n., l. c. p. 37, f. 10, Tiflis; *ibericus*, Mots., Georgia; *curtulus*, Mots., Caucasus, Asia Minor; *intermedius*, sp. n., l. c. p. 41, f. 13, Armenia and Caramania; *tetraodon*, Thunb., *bidens*, Thunb., *orientalis*, Ktz., = *syriacus*, Mots., *subvelutinus*, sp. n., l. c. p. 46, f. 17, North Persia; *tenebrosus*, sp. n., l. c. p. 47, Lenkoran; *macrophyllus*, Reiche; *barbarossa*, F.

Lucanus hopei, Parry, *sericans*, Voll.,=*maculifemoratus*, Mota; *Hexarthrus chaudi*, Deyr.,=*rhinoceros* (Ol.): Parry, Tr. E. Soc. 1870, p. 56. The author recharacterizes this group, which he restricts to *Mesotopus*, *Lucanus*, *Pseudolucanus*, *Rhætus*, and *Hexarthrus*. *Pseudolucanus*, proposed by Hope for *capreolus* (L.) and *atratus* (Hope), is extended by him to *barbarossa* (F.) and *mazama* (Lec.); figured by Parry, pl. 1. f. 1; and, attributing slight importance to Hope's character of the head of the ♂ not being angulated above, he considers the mandibles to afford the least variable diagnostic guide for it, stating that they seldom exceed the length of the head, are always strongly curved, and never present more than one tooth on their inner edge.

Odontolabides.

PARRY (Tr. E. Soc. 1870, p. 74) considers that *Odontolabis*, *Chalcodes*, *Heterochithes*, and *Neolucanus*, hitherto located in the *Lucanides*, present sufficient characters in common to distinguish them from that subfamily and from his *Cladognathides*. These characters are:—clava of ant. triarticulate, the leaflets being but moderately produced; clypeus remarkably small; eyes divided in both sexes by a canthus; ant. tibiæ in ♂ often considerably curved, with variable armature, 4 post. tibiæ in both sexes invariably unarmed. The author figures (pl. iii. figs. 4, 5, 6) three forms of the mandibles of *Odontolabis castelnaudi*, Parry, and briefly recharacterizes Westwood's *Chalcodes*. *Odontolabis gracilis*, Kaup,=*bellicosus* (Lap.), var. max.; *O. inæqualis* (Kaup)=*bicolor* (Ol.), var.; *Neolucanus baladeva* (Hope, *Odont.*) and *angulatus* (Hope)=*lama* (Ol.): Parry, l. c.

Cladognathides.

PARRY (l. c. p. 75) unites *Cladognathus*, *Psolidoremus*, *Metopodontus*, *Prosopocoilus*, *Homoderus*, *Cyclommatus*, *Prismognathus*, *Cantharolethrus*, *Leptinopterus*, *Metadorcus*, g. n., and *Macrocrates* under this head, distinguishing them from the *Odontolabides* by their eyes never (except in 2 spp. of *Prosopocoilus*) being entirely divided by a canthus, and by the ant. tibiæ in ♂ being straight, and the 4 post. tibiæ variably armed in ♂ and unidentate (except as above) in ♀. The invariable want of tubercles on the head of the female separates them from certain of the *Dorcide*, to which they appear otherwise closely allied.

Cladognathus impressus, C. O. Waterh., is now ascertained to be a *Metopodontus*, and is figured pl. iii. f. 1; *C. 4-nodosus*, Parry,=*m'cllandi*, Hope, var. max.; the ♀ of *Prosopocoilus wallacii*, Parry, from Gilolo, is described; *P. natalensis*, Parry, pl. ii. figs. 8, 9, and *P. approximatus*, Parry, pl. iii. figs. 2, 7, are figured, and the Indian locality of *P. perplexus*, Parry, is substantiated; the generic characters of *Aulacostethus* (C. O. Waterh.) are discussed, and deemed insufficient to remove *A. archeri* from *Prosopocoilus*; *Prosopocoilus crenicollis*, Thoms.,=*bulbosus* (Hope, Tr. Linn. Soc. nec Cat. Luc.)=*spencii* (Hope), which is figured pl. ii. fig. 1; *P. 4-dens* (Hope)=*antelopius* (Swed.); additional characters are given for *Homoderus* (Parry); *Cyclommatus maitlandi*, Parry,=*faunicolor* (Hope), var. max.; *Cyclorasis jekeli*, Parry,=*Prismognathus subæneus* (Mots.), of which *dauricus* (Mots.) is ♀; *Metopodontus savagii* (Hope) is figured pl. ii., ♂ var. min. f. 4, var. max. f. 7; Parry, l. c.

DEYROLLE (Pet. Nouv. 22, p. 87) notes *Cyclommatus tarandus* ♂ from Borneo, varying from 21 to 65 millim. in length.

Metadorcus, g. n., Parry, l. c. p. 88. Allied to *Leptinopterus*, but with more robust and arched mandibles, the head tuberculate behind the eyes, and very short and convex elytra. Sp. *M. rotundatus* (Parry).

Cladognathus (? *Metopodontus*) *torresensis*, sp. n., H. Deyrolle, Tr. E. Soc. 1870, p. 80, pl. i. f. 3 (♀), 4 (♂), Torres Straits.

Metopodontus (?) *swanzianus*, sp. n., Parry, l. c. p. 81, pl. ii. f. 2, W. Africa.

Prosopocoilus mysticus, sp. n., Parry, l. c. p. 82, Malacca.

Dorcides.

Dorcus costatus (Lec.) and *D. brevis*, Say, = *parallelus*, Burm.; *D. eurycephalus*, Burm., is distinct from *bubalus*, Pty., which = *bucephalus*, Pty., of which the habitat is exclusively Java; *Eurytrachelus tityus*, Hope, is figured, pl. iii. figs. 3, 8; *E. tian* (Boisd.), *westermanni*, Hope, and *platymelus*, Saund., are possibly geographical vars. of the same sp.; *E. thomsoni*, Parry, = *ternatensis* (Thoms.); *Cladognathus bisignatus* = *fulvonotatus*, Parry, var. *min.*, and is now placed in *Eurytrachelus*, as also is *C. elegans*, Parry; *Dorcus* (?) *derelictus*, Parry, is figured pl. ii. f. 3, and is still of unsettled position; *Ægus kandiensis* (Hope) is figured pl. ii. figs. 5, 8, and redescribed; a full account of *Lissotes curvicornis* (Boisd.) and *L. cancrroides* (F.) is given, they being considered distinct spp.; *Sclerostomus cribratus*, Thoms., ♀, *S. ditomoides* and *neotragus*, Westw., ♂, = *cruentus*, Burm.; indications of 5 new spp. of *Lissotes* (*launcestoni*, *latidens*, *forcipula*, and *subcrenatus*, Westw. MS., and *furcicornis*, Howitt, MS.) are given. Parry, l. c. p. 61 *et seq.*

Dorcus truquii (Muls.). Baudi, B. E. Z. xiv. p. 64, note, briefly describes the ♂ of this sp.

Eurytrachelus niponensis, Vollenh., = *Macrodorcas rectus*, Mots., of which *rugipennis*, Mots., is probably only a var.: C. O. Waterhouse, Ent. M. M. vi. p. 207. Motschoulsky himself also so refers Vollenhoven's sp., Bull. Mosc. xliii. p. 27, note.

Platycerus quercus, Sch., is recorded as injuring young pear-shoots in N. America by eating the buds. Amer. Ent. & Bot. ii. p. 212, f. 129.

Pseudodorcus, g. n., Parry, l. c. p. 94. Mandibles and head small; prothorax rounded; tibiæ spinose, ant. tibiæ broad. Sp. *P. (Dorcus) hydrophiloides* (Hope), of which *carbonarius* (Westw.) is the ♀. Parry, *ibid.*

Lissapterus, g. n., H. Deyrolle, Tr. E. Soc. 1870, p. 98. Antennæ destitute of leaflets, terminal art. abruptly truncate at apex; ant. tibiæ produced and bidentate beyond insertion of tarsi; head monstrous, eyes very small and entirely divided by canthus. Sp. *L. (Lissotes) howittianus* (Westw.).

Macrodorcas opacus, sp. n., C. O. Waterhouse, l. c. p. 208, Hakodadi (to be referred to *Eurytrachelus*, see Parry, l. c. p. 91, who considers that, if Waterhouse's synonymy prove correct, *Macrodorcas* is not entitled to generic rank).

Sclerostomus. H. Deyrolle, Tr. E. Soc. 1870, describes the following Chilean new spp.:—*S. tristis* and *marginipennis*, p. 95, *elongatus*, p. 96.

Eurytrachelus candezii, sp. n., Parry, l. c. p. 90, pl. i. f. 2, Java.

Lissotes opacus, sp. n., H. Deyrolle, l. c. p. 97, Van Diemen's Land.

Figulides.

Cardanus cribratus, sp. n., Parry, l. c. p. 98, Philippines.

Æsalides.

The ♀ of *Ceratognathus westwoodii* (Thoms.), from Melbourne, is recorded by Parry, *l. c.*

Nicagus (*Ochodæus*) *obscurus* (Lec.), having slightly movable leaflets to its clava, is considered to agree with certain Australian spp. of *Ceratognathus*. It has hitherto been placed in the *Scarabæide*, near *Trox*: Parry, Proc. E. Soc. 1870, p. iii. Westwood, *ibid.* p. ix, considers Leconte's species not referable to any of the Lucanoid families.

Ceratognathus abdominalis, sp. n., Parry, *l. c.*, Moreton Bay.

Sinodendrides.

Sinodendrum americanum, Palisot, = *cylindricum* (L.): Parry, *l. c.* p. 100.

SCARABÆIDÆ.

Coprides.

Phanæus minos, Er., = *meleagris*, Blanch.; *Onthophagus truncaticornis* (Boh. nec Schall.) is named *trucidatus*: v. Harold, C. H. vi. pp. 105 & 106.

Copris longiceps, Burm., = *Pinotus eremita*, v. Har.: v. H., *ibid.* p. 181.

v. HAROLD (Ann. Soc. Ent. Fr. 4^e sér. ix. p. 493 *et seq.*) describes several new Mexican species of *Coprides* from Sallé's collection, redescribing others, with fresh localities and corrections.—*Copris incertus*, Say, is substantiated by its male being described.

Pinotus colonicus (v. Har. nec Say) is renamed *eremita* (PP = *Copris cænosus*, Er.); *P. bituberculatus* ♂, v. H., = *colonicus*, Say: v. Harold, *l. c.* p. 500.

The ♂ of *Ontherus mexicanus*, v. Har., is described by v. Har. *l. c.* p. 508.

Eurysternus marmoreus, Casteln., includes 2 spp., one from Colombia, the other from Mexico; the former is accepted as the type, and is redescribed: v. Har. *l. c.* p. 506.

There are no claws to 4 hinder tarsi of *Gromphas*, as Lacordaire states: H. W. Bates, Tr. E. Soc. 1870, p. 175.

Onitis nicanor (Lec. nec Fab.), stated to be from N. Carolina, = *fossor*, Boh., a S.W. African sp.: Sallé (Ann. Soc. Ent. Fr. 4^e sér. ix. p. 501, note).

BAUDI (B. E. Z. xiv. p. 65) notes *Onthophagus tages* (Ol.), var. *consors*, Reiche, and vars. of *O. taurus* (L.).

Oruscatus, g. n., H. W. Bates, Tr. E. Soc. 1870, p. 174. Allied to *Phanæus*; club of ant. not funnel-shaped; ant. legs with no tarsi, with 4-dentate tibiæ, in ♂ very long; interm. tibiæ straight externally, dentate.—Sp. *O. davus* (Er., *Phanæus*); *O. opalescens*, sp. n., Bates, *l. c.* p. 174, Equador.

New species:—

Deltochilum. H. W. Bates, *l. c.*, describes the following new spp.:—*D. tessellatum*, p. 175, Gualaquiza, Ecuador; *calcaratum*, p. 176, Bahia; *barbipes* and *aspericollis*, p. 177, *femorale* and *fuscocupreum*, p. 178, *granulatum* and *6-tuberculatum*, p. 179, *latiusculum*, p. 180, Amazons.

Uroxyis levipennis, Kirsch, B. E. Z. xiv. p. 355, Bogotá.

Ontherus brevicollis, Kirsch, *l. c.* p. 356, Bogotá; *O. azteca*, v. Har., Ann. Soc. Ent. Fr. 4^e sér. ix. p. 503, Mexico.

Eurysternus claudicans, Kirsch, *l. c.* p. 360, and *E. nebulosus*, Kirsch, *l. c.* 1870. [VOL. VII.]

p. 361, Bogotá; *E. mexicanus*, v. Har. l. c. p. 505 (= *marmoreus*, Casteln., pars), and *E. angustulus*, v. Har. l. c. p. 506, Mexico.

Pinotus. v. Harold, l. c., describes the following new spp. from Mexico:—*P. amplicollis*, p. 501; *centralis* and *sagittarius*, p. 502.

Pinotus foveicollis and *P. incisus*, Kirsch, l. c. p. 357, Bogotá.

Gromphas amazonicus, H. W. Bates, l. c. p. 175, U. Amazons.

Phanæus haroldi, Kirsch, l. c. p. 358, and *P. bogotensis*, Kirsch, l. c. p. 359, Bogotá; *P. lunaris*, Taschenberg, Z. ges. Naturw. 1870, Bd. i. p. 183, Ecuador.

Copris. v. Harold, l. c., describes the following new spp. from Mexico:—*C. læviceps* and *sallei*, p. 496; *rebouchei* and *boucardi*, p. 497; *armatus* and *klugi*, p. 498.

Copris (*Dichotomius*, Hope; *Selenocopris*, Burm.) *scalpellum*, Taschenb. l. c. p. 181, Ecuador; *C. (Selen.) simplex*, Tasch. l. c. p. 182, Columbia.

Onthophagus. v. Harold, l. c., describes the following new species from Mexico:—*O. hippopotamus*, p. 507; *chevrolati*, p. 508 (var. *chalybeus*); *retusus* and *semiopacus*, p. 509; *crinitus* and *rhinolophus*, p. 510; *rostratus*, p. 511, *höpfneri*, p. 512.

Onthophagus femoralis, Kirsch, l. c. p. 362, Bogotá.

Aphodiides.

Aphodius aurelianus, v. Har., = *ruvicola*, Melsh.; *A. meridionalis*, Villa, = *hydrocharis* (F.); *A. rufus*, Sturm, nec Moll, is named *sturmi*: v. Harold, C. H. vi. p. 106.

BAUDI (B. E. Z. xiv. p. 66) makes observations on *Aphodius lucasi*, v. Har., from Asia Minor, Sardinia, and Malta; notes var. of *A. trucidatus*, v. Har.; and (note) gives brief characters for *A. jugicola*, v. Har.; *A. mixtus*, Villa, = *thermicola*, St., sec. typ., Baudi (l. c. p. 67, note). The author also (*ibid.*) discusses *A. gagatinus*, Mén., from the Maritime Alps.

CHAPMAN (Ent. M. M. vi. p. 230) adds some further notes on the parasitism of *Aphodius porcus* upon *Geotrupes stercorarius*.

v. HAROLD (C. H. vi. p. 19 *et seq.*) recharacterizes the genus *Euparia* (Serv.), and describes 6 spp., of which 2 are new.

New species:—

Aphodius perezi, v. Harold, B. E. Z. xiv. Beih. p. 113, Malaga; *A. diecki*, v. Har. l. c. p. 114, Algesiras; *A. turbatus*, Baudi, l. c. p. 66, Cyprus; *A. sabulicola*, Thoms., Skand. Col. x. p. 16, Sweden (= *punctatosulcatus*, Stm.: v. Harold, C. H. vi. p. 117).

Euparia cypria, Baudi, l. c. p. 68, Cyprus (= *Coptochirus singularis*, v. Har., Kraatz, *ibid.* p. 90, note; this is erroneous, *fide* v. Harold, who, C. H. vi. p. 119, refers Baudi's insect to his *Atanius horticola*); *E. friedenreichi*, v. Har., C. H. vi. p. 27, and *E. attenuata*, v. Har. *ibid.* p. 28, Brazil.

Psammodius levistriatus, Perris, L'Ab. vii. p. 13, Sardinia.

Geotrupides.

Geotrupes. Baudi (B. E. Z. xiv. p. 71, note) gives brief characters for ♂ of *G. fimicola*, Muls., and notes a var. from Sardinia of *G. geminatus*, Géné.

The *Geotrupes stercorarius* of Erichson is not Linnæus's species of that name (with which *putridarius*, Er., is synonymous), but is specifically di-

stinct, and is redescribed and named *mesoleius* by Thomson (Skand. Col. x. p. 331).

Geotrupes matutinalis, sp. n., Baudi, l. c. p. 70, note, Sardinia.

Pleocomides.

SCHAUFUSS (Nunq. Otios. pp. 50-59) gives various particulars of the genus *Plecoma*, Lec., and describes two new species, *P. staff*, l. c. p. 52, and *P. hirticollis*, p. 58, S. California. The specific name of the former is given with an evidently jocose intention, being founded on the "Prussian general staff" of the 'Figaro.'

Trogides.

Glaresis beckeri, sp. n., Solsky, Bull. Mosc. xlii. p. 463, Sarepta (?=*Trax eversmanni*, Zoubk.).

Glaphyrides.

SCHREIBER (B. E. Z. xiv. pp. 1-10, Taf. 1. figs. 1-5) records at some length his observations on the economy, and describes and figures (with details) the larva and pupa, of *Anthypna abdominalis* (F.).

Melolonthides.

DESB. DES LOGES (L'Ab. vii. p. 98) redescribes his *Hoplia pilifera*.

BAUDI (B. E. Z. xiv. p. 71, note) describes forms and sexes of *Hoplia minuta* (Pz.)=*pulverulenta* (Schm.). At p. 72 he refers to vars. of *Serica rugosa*, Blanch., *Polyphylla fullo* (L.), *Anoxia orientalis*, Cast., *Melolontha vulgaris* and *M. hippocastani*.

Hymenophia bifrons (Esch.), *lineolata*, Blanch., *cristata*, Graëlls,=*strigosa* (Ill.); *H. lineolata*, Ramb., *costulata*, Graëlls,=*rugulosa*, Muls.; *H. miegii*, ♂, Graëlls,=*fulvipennis*, Blanch.: v. Heyden, B. E. Z. xiv. Beih. p. 180 et seq.

Monotropus staudingeri, Schauf. The author redescribes this sp. (Nunq. Otios. p. 42), which he affirms to be generically distinct from *Rhizotrogus lusitanicus*, Gyl., and *R. angulicollis*, Fairm.

The hitherto unknown ♀ of *Rhizotrogus bellieri*, Rche., is recorded by Bellier from Corsica (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. pp. iv and xxviii).

Rhizotrogus reflexus, Blanch. nec Fab., *fastidiosus*, Fairm.,=*barbarus*, Luc.: Lucas, Ann. Soc. Ent. Fr. 4^e sér. ix. p. 524, note.

The ♀ of *Polyphylla mauritanica*, Luc., is described, from Algeria, by Lucas, l. c. p. 530: that species appears to have been accidentally omitted from Gemm. & v. Harold's Cat.

DIECK (B. E. Z. xiv. p. 182, note) demurs to Marseul's suppression of *Melolontha hybrida*, Charp., as a syn. of *M. papposa*, Ill.

Anomala contermina, Walk., is a *Lachnosterna* (*Trichesthes*), probably *tristis* (F.), with which *pilosicollis* (Knoch) is synonymous; *Rhizotrogus collocatus*, Walk.,=*Phobetus testaceus*, Lec.; *Ancylonycha nigropicea*, Walk.,=*Diplo-taxis brevicollis*, Lec.; *A. consequens* (Walk.) is also a *Diplo-taxis*; *A. un-notata* (Walk.) is a *Lachnosterna*; *Serica crassata*, Walk.,=*anthracina*, Lec.: Lec., Ann. N. H. ser. 4, vi. p. 400.

New species :—

Hoplia (Decamera) ramburi, v. Heyden, l. c. p. 115, Andalusia.

Hymenophila lata, v. Heyd. l. c. p. 180, Serra Estrella and Coimbra; *H. angusta*, v. Heyd. l. c. p. 181, Andalusia; *H. estrellana*, v. Heyd. l. c. p. 182, Serra Estrella.

Triodonta raymondi, Perris, L'Ab. vii. p. 15, Sardinia.

Pachydema oraniensis, Luc., Ann. Soc. Ent. Fr. 4^e sér. ix. p. 525, Oran; *P. lessepsii*, Luc. l. c. p. 527, Egypt.

Philochlœnia burmeisteri, Kirsch, B. E. Z. xiv. p. 362, Bogotá.

Rhizotrogus alicantanus, Dieck, B. E. Z. xiv. Beih. p. 118, Alicante; *R. procerus*, Baudi, l. c. p. 73, note, Piedmont; *R. sassariensis*, Perris, L'Ab. vii. p. 14, Sardinia.

Amphimallus cantabricus, v. Heyd. l. c. p. 116, Santas Albas and Serra de Gerez.

Ancylonycha nitens, Baudi, l. c. p. 75, Cyprus (is a *Rhizotrogus*, sec. typ., according to Reiche; Kraatz, *ibid.* note); *A. rugipennis*, Schaef., Nung. Otios. p. 31, Mexico; *A. nitidula*, G. des Cottes, Pet. Nouv., 15 July, 1870 (*Adoretus*?; cf. p. 108).

Aplidia pruinosa, Baudi, l. c. p. 74, Asia Minor.

Rutelides.

Anomala vitis. For observations by Dei on this pest, cf. Bull. Ent. Ital. ii. p. 288.

BAUDI (B. E. Z. xiv. p. 76) refers to a supposed var. from Cyprus of *Adoretus syriacus*, Blanch., under the name *pullus*. Kraatz (*ibid.* note) quotes Reiche's opinion that this is a new species.

Pelidnota punctata (L.) is figured and described in its chief stages, and particulars of its economy are given amongst those of other insects injurious to the grape-vine, by Riley, Amer. Ent. & Bot. ii. p. 295, f. 185.

New species :—

Anisoplia pallidiventris, G. des Cottes (diagnosis only), Pet. Nouv., 15 July, 1870, Tiflis.

Antichira robusta and *A. cupripes*, Kirsch, B. E. Z. xiv. p. 364; *A. planipennis*, Kirsch, l. c. p. 365, Bogotá.

Thyridium blanchardi, Kirsch, l. c. p. 366, and *T. hirtum*, Kirsch, l. c. p. 367, Bogotá.

Chlorota bogotensis, Kirsch, l. c. p. 368, Bogotá.

Platycoelia nervosa, Kirsch, l. c. p. 369, Bogotá.

Leucothyreus aneiceps, Kirsch, l. c. p. 370, Bogotá.

Adoretus (?) *squamosus* and *A. nitidulus*, Gautier des Cottes; diagnosis in Pet. Nouv., 15 July 1870, S. Russia (the latter species afterwards stated by des Cottes to be an *Ancylonycha*, *ibid.* p. 108).

Pelidnota obscura, Taschenberg, Z. ges. Naturw. 1870, Bd. i. p. 184, Columbia.

Dynastides.

Dynastes tityus (L.) is figured in Amer. Ent. & Bot. ii. p. 374, f. 224.

BAUDI (B. E. Z. xiv. p. 77) refers to a var. from Asia Minor of *Pentodon monodon* (F.), provisionally named *xyphias* by Truqui.

LUCAS (Ann. Soc. Ent. Fr. 4^e sér. x., Bull. p. xli) remarks generally on *Megalosoma*, and records the pupæ of both sexes of *M. actæon* (L.), from Cayenne.

New species :—

Cyclocephala longiceps, Kirsch, B. E. Z. xiv. p. 370, and *C. munda*, Kirsch, l. c. p. 371, Bogotá; *C. marginalis*, Kirsch, l. c. p. 372, Sta. Catharina, Brazil.

Stenocrates lævicollis, Kirsch, l. c. p. 373, Bogotá.

Corynoscelis 4-dens, Taschenb. Z. ges. Naturw. 1870, Bd. i. p. 185, Ecuador.

Heterogomphus 6-dentatus, Taschenb. l. c. p. 186, Bogotá.

Pentodon dispar, Baudi, l. c. p. 76, Cyprus (= *puncticollis*, Burm., sec. typ., according to Reiche: Kraatz, *ibid.* note).

Cetoniades.

DESBROCHERS DES LOGES (B. E. Z. xiv. Beih. p. 119) describes, under the name *raffrayi*, an Andalusian var. of *Cetonia oblonga*, Gory, and (L'Ab. vii. p. 98) redescribes his own *Cetonia subpilosa*.

BAUDI (B. E. Z. xiv. p. 78) briefly describes vars. from Cyprus of *C. floricola*, Hbst.

Euryomia melancholica (G. & P.) is figured, and recorded as damaging pear-blossoms in Illinois, Amer. Ent. i. p. 32, f. 23.

Cremastochilus armatus (Walk.) = *angularis* (Lec.): Lec., Ann. N. H. ser. 4, vi. p. 400.

Neophædimus [rectius *Neophædimus*], g. n., Lucas, Ann. Soc. Ent. Fr. 4^e sér., Bull. p. lxxx. Near *Mycteristes*, Cast., and *Phædimus*, Westw.; differing from the former in its much larger, more elongate, and anteriorly bicornute frontal development, much more pronounced sternal tubercle, and shorter and stouter anterior legs; and from the latter, apart from the above mentioned frontal peculiarities, in its spiniform thoracic prolongation, which is situated *behind* the ant. border. Sp. *N. auzouzii*, sp. n., Luc. *ibid.* p. lxxxi, Se-Tchuen.

Gymnetis lutulenta, sp. n., Kirsch, B. E. Z. xiv. p. 374, Bogotá.

BUPRESTIDÆ.

E. SAUNDERS (Cat. of spp. cont. in *Buprestis*, Linn. &c.) gives a list of the species contained in the genus *Buprestis* of Linnæus previous to its subdivision by Eschscholtz in 1829, referring each to its present genus. Somewhat original views on the laws of nomenclature are indicated in the preface.

The author makes the following changes:—*Julodis tomentosa* (Hbst. nec Ol.) to *herbstii*; *Chrysaspis aurata* (F. nec Pall.) to *chryspennis*; *C. elongata* (Ol. nec Hbst.) to *elongaluta* [sic]; *Psiloptera variolosa* (F. nec Panz.) to *binominata*; *P. morbillosa* (Ol. pl. iv. nec pl. viii.) to *olivieri*; *Acmæodera polita* (Kl. nec Say) to *klugii*; *Sphenoptera polita* (Thunb. nec Say) to *thunbergi*; *Conognatha trifasciata* (F. nec Thunb.) to *fasciolata*; *Melybeus æneicollis* (Villers nec Deg.) to *villersii*; *Agelia limbata* (Wiedm. nec Don.) to *wiedmanni*; *Stenogaster plana* (F. nec Ol.) to *planula*; *Agrius leucostictus* (Kl. nec Kby.) to

albomaculifer; *A. pusillus* (Say nec Ol.) to *parvus*; *A. purpureus* (Thunb. nec Ol.) to *proximus*; *A. lateralis* (Say nec Ol.) to *sayi*; *Trachys pusilla* (F. nec Ol.) to *erilis*.

SCHÖDTE (Nat. Tids. vi. pp. 353-378, tab. i. & ii.) figures and describes, with details, the larvæ of *Euchroma columbicum* (Mann.), t. i. figs. 1-15; *Chrysobothris affinis* (F.), t. ii. figs. 1-8; *Anthaxia candens* (F.), t. ii. figs. 9-12; *Agrilus biguttatus* (F.), t. ii. figs. 13-17; *Trachys minuta* (L.), t. ii. figs. 18-22. The author gives general characters for the larvæ of the *Buprestidae*, with elaborate particulars, and (pp. 364-368) a morphological table of the different parts in those of *Euchroma*, *Eurythyrea*, *Ancylochira*, *Chrysobothris*, *Anthaxia*, *Agrilus*, and *Trachys*. He also describes (without figuring) the larvæ of *Eurythyrea micans* (F.) and *Ancylochira rustica* (L.).

BAUDI (B. E. Z. xiv. p. 78 *et seq.*) notes vars. from Cyprus and Asia Minor of *Julodis ehrenbergii*, Lap., *Steraspis squamosa*, Klug, *Buprestis stigmatica*, Dalm., and *chlorana*, Lap., *Capnodis tenebricosa* (F.), *Ancylochira ledereri*, Mars., *Anthaxia præclava*, Mann., *hypomelana*, Ill. (considered a distinct species by de Marseul: Ktz. *ibid.* p. 79, note), and *mulsanti*, Mars., *Ptosima flavoguttata* (Ill.), *Acmaeodera bijuga*, Muls., *Coræbus amethystinus* (Ol.), *Agrilus roscidus*, Kiesw. He also makes some observations upon *Polystenus rhois*, Mars.; considers de Marseul wrong in referring *Acmaeodera pruneri*, Géné, as a var. to *A. 18-guttata* (Pill.), giving his reasons (p. 81, note) for thinking the latter a var. of *4-fasciata* (Rossi); describes an *Agrilus* (p. 86, note) from Piedmont, which he refers with doubt to *subauratus*, Gebl.; notes (and names *cytisi*) a var. from the Maritime Alps of *A. cinctus* (Ol.); and describes an example of the Algerian *Trachys hipponensis*, Mars., taken at Turin.

Damages caused to apple-trees in N. America by *Chrysobothris femorata* (F.), and remedies, are discussed in Amer. Ent. ii. p. 146, by Wielandy.

Ancylochira ornata, Walk., = *langii* (Mann.): Lec., Ann. N. H. ser. 4, vi. p. 401.

The habits of *Ancylochira 8-maculata*, *Ptosima 9-maculata* (the ♀♀ of which "seemlent?"), *Agrilus subauratus*, *sinuatus*, and *cinctus* are mentioned by Claudon (Ann. Soc. Ent. Fr. 4^e sér. x. p. xii).

Agrilus ruficollis (F.) is figured, with its larva, and a gall produced by it on raspberry (named *rubi podagra*), in Amer. Ent. ii. p. 133, figs. 68 and 69. Its habits are described. The larva is redescribed and figured, *ibid.* p. 128, f. 90.

ANCEY (L'Ab. vii. p. 87) notes the economy of *Agrilus 6-guttatus* (Hbst.).

ABELLE DE PERRIN (Ann. Soc. Ent. Fr. 4^e sér. x., Bull. p. lxxix) describes at full length his *Agrilus sulcaticeps*, of which the diagnosis was published in Pet. Nouv., 1 Dec. 1869. He notes (l. c. ix. p. liii & x. p. xxxvii) the habits of *Coræbus bifasciatus* and *undatus*, which frequent the top branches of oak trees.

PERRIS (L'Ab. vii. p. 34) records the larva of *Trachys pumila* as mining the leaves of *Mentha rotundifolia* and *M. pulegium*; other recorded plants for the sp. being also *Labiatae*.

KRAATZ (C. H. vi. p. 31) considers *Trachys* to be the Greek adjective signifying "rough," and not to be a word of no meaning, as v. Harold states. The question of masculine or feminine terminations to the names of its species is also discussed. Cf. v. Harold, *ibid.* p. 116.

Acmæodera. Baudi, *l. c.*, describes the following new species:—*A. confluens*, p. 81, Cyprus, Roumelia, and *A. quadrifaria*, p. 83, ? Cyprus [these two are referred to Truqui]; *rufocincta*, p. 82, Cyprus; *placida*, p. 84, *despecta*, p. 85 (no localities, but ? Cyprus).

Sphenoptera minutissima, sp. n., Desbr. des Loges, B. E. Z. xiv. Beih. p. 119, Sierra Morena.

Anthaxia quadrifoveolata, sp. n., Solsky, Hor. Ent. Ross. vii. p. 359, Siberia.

THROSCIDÆ.

BAUDI (B. E. Z. xiv. p. 88, note) describes a var. from Sardinia of *Throscus brevicollis*, Bonv., records *T. obtusus*, Curtis, from Piedmont (p. 89, note), and gives, with doubt, sexual characters for *T. orientalis*, Bonv., p. 89; and (p. 90, note) gives male characters for *Farsus unicolor*, Latr., from Italy.

Throscus elateroides (Redt. nec Heer) = *carinifrons* (Bonv.) according to Bethé, S. E. Z. xxxi. p. 328, who recapitulates the German spp. of the genus.

Drapetes flavipes, sp. n., Baudi, *l. c.* p. 87, Cyprus.

Throscus similis, sp. n., Baudi, *l. c.* p. 89, note, Piedmont.

ELATERIDÆ.

Adelocera vetusta, Walk., = *cavicornis*, Lec.; *Athous 4-vittatus*, Walk., = *Corymbites lateralis*, Lec., var.; *Diacanthus semimetallicus*, Walk., *tinctus*, Lec., = *Corymbites æripennis*, Kby.: Lec., Ann. N. H. ser. 4, vi. p. 401.

Elatér satrapa, Kies., = *dibaphus*, Schiödt; *E. cardinalis*, Schiödt, = *præustus*, F.: Thoms., Skand. Col. x. pp. 102 and 103.

BAUDUER (Nouv. et faits div., no. 10) records his discovery of several individuals of *Elatér ruficeps*, Muls., in cells in rotten bark of oak, beneath white lichen (? *Parmelia*).

DESBR. DES LOGES (L'Ab. vii.) redescribes his *Cardiophorus convexithorax*, p. 99, *maculicrus*, p. 100 (and var. ? *belonis*, from Malta), *hipponensis*, p. 102, *mauritanicus* [nomen prius usitatum] and *pusillus*, p. 103, *seneci*, p. 104, *Cryptohypnus propinquus* and *Athous nigerrimus*, p. 106, *A. sinuaticollis*, p. 112, *depressifrons*, p. 113, *fallax*, p. 115; describes the ♀ of *A. castanescens*, Muls. et Guill., from the Higher Alps, p. 116, and a var. of *Agriotes sputator* (L.) from Allier, which he names *melanocephalus*, p. 119; redescribes the ♀ of his *Agriotes attenuatus*, under the name *meridionalis*, *ibid.*; also redescribes his *A. brevisculus*, p. 121, which, by its forehead being arched and porrect in the middle, belongs to *Betarmon*, Kies., in which Candèze has only included *bisbimaculatus*; the other species, with similarly constructed foreheads, the author thinks should be excluded from *Agriotes*, and he proposes the name *Metopius* for the genus to contain them.

SCHAUFUSS (Nunq. Otios. pp. 44-46) redescribes his *Cardiophorus longicollis* (which he affirms to be specifically distinct from *C. graellsii*, Cand.) and *Athous cantabricus*.

Cardiophorus farinesi (Vill.), *sec. typ.*, = *biguttatus* (F.), var. *ornatus*, Cand.: v. Harold, C. H. vi. p. 110.

Melanotus fascicularis, Küst., is distinct from *brunnipes*, Germ.: Kraatz, B. E. Z. xiv. p. 271 (*sec. typ.*).

Athous niger. Under this head Thomson (*l. c.* pp. 355 & 356) states that

two distinct species are confused; these he describes and names respectively *deflexus* and *porrectus*.

Limonium tibellus, Chev., = *Corymbites nivicola*, Kies.: v. Kiesenw., B. E. — . 2 xiv. Beih. p. 120.

RUPERTSBERGER (Verh. z.-b. Ges. Wien, xx. p. 894) describes the larva and pupa, and observes upon the economy of *Corymbites cinctus* (Panz.). He also (p. 836) records, with some doubt, his observations on the larva of another species of *Corymbites*.

Selatosomus cærulescens, *depressicornis*, and *melancholicus*?, Mots., = *Corymbites melancholicus* (F.); *Diacanthus gracilis*, Mots., = *C. lævicollis* (Mann.): Solsky, Hor. ent. Ross. vii. p. 364.

For observations on the synonymy &c. of *Elatér pomorum*, *E. elongatulus*, *Cardiophorus farinæsi*, *Melanotus niger*, *Limonium cylindricus*, *Corymbites kiesewetteri*, *globoicollis*, *profugus*, and *tessellatus*, and *Campylus*, in connexion with v. Harold's remarks in C. H. v. pp. 88 *et seq.*, cf. v. Kiesenwetter, *ibid.* vi. pp. 33-36.

New species:—

Lacón argillaceus, Solsky, Hor. Ent. Ross. vii. p. 360, E. Siberia.

Cosmeus discoidalis and *C. flaveolus*, Kirsch, B. E. Z. xiv. p. 375, Bogotá.

Deromecus pusillus, Kirsch, l. c. p. 376, Bogotá.

Melanotus picticornis, v. Heyden, B. E. Z. xiv. Beih. p. 119, Serra Estrella.

Athous. Desb. des Loges, l. c., describes the following new species:—*A. æneithorax*, p. 108, Hanover; *conicicollis*, p. 109, French Alps; *pallidipennis* [nomen prius usitatum], p. 110, Higher Alps; *grandini*, p. 111, Béziers; *florentinus*, p. 114, Florence; *quadricollis*, p. 134, Isère.

Athous oblongus, Solsky, l. c. p. 362, E. Siberia.

Ludius luctuosus, Solsky, l. c. p. 364, E. Siberia.

Agriotes infuscatus, Desb. des Loges, l. c. p. 117, Mingrelia.

CEBRIONIDÆ.

New species:—

Cebris tarifensis, Dieck, B. E. Z. xiv. Beih. p. 121, Tarifa; *C. parvicollis*, Dieck, l. c. p. 122, Jaén; *C. malaccensis*, Dieck, l. c. p. 124, Malaga; *C. bruleriet*, v. Heyden, *ibid.* p. 122, Serra Estrella; *C. sardous*, Perris, L'Ab. vii. p. 16, and *C. varicolor*, Perris, l. c. p. 17, Sardinia.

DASCILLIDÆ.

Cyphon fuscicornis, Thoms., = *coarctatus* (Payk.), ♀; *C. pallidiventris*, Thoms., = *nitidulus*, Thoms., ♀: Thoms., Sk. Col. x. p. 107.

GEMMINGER (C. H. vi. p. 110) alters *Paralichas* (White) to *Paralichus*.

Ectopria, Lec., the N. American representative of *Eubria*, is not sufficiently distinct from the Mexican *Dicranopselaphus*, Chev.: Lec., Ann. N. H. ser. 4, vi. p. 404.

Elodes zanthurus and *E. angustatus*, Chev., Ann. Soc. Ent. Fr. 4^e sér. x. p. 68, Cuba.

Scirtes. Chevrolat, l. c., describes the following new spp. from Cuba:—

S. 6-lineatus, *interruptus* [an var. *præc.* ?], and *cinctipennis*, p. 69; *S. apicalis* and *fuscus* (with 3 vars.), p. 70.

Psilodactyla. Chevrolat, l. c., describes the following new spp. from Cuba: — *P. ramicornis* and *simplex* [an ♀ *præc.* ?], p. 70; *emarginata* and *annulicornis*, p. 71; *militaris* and *carbonaria*, p. 72.

MALACODERMATA.

Lycides.

CHEVROLAT (Ann. Soc. Ent. Fr. 4^e sér. x. p. 73) considers that four different species have hitherto been confused under the name *Calopteron* (*Lycus*) *bicolor*, and that the older authors erroneously attributed the group to Africa, as it actually belongs to the Antilles. He shortly describes type *C. bicolor* (L.), and redescribes *C. bicolor* (Lap. nec L.), from St. Domingo, not Cuba, under the name *dominicense* (ibid.); *bicolor* (Ol. nec L.; ? *Lycus militaris*, Dalm.), from Jamaica, under the name *denominatum*, p. 74; *bicolor* (Duv. nec L.), from Cuba, under the name *nigritarse*, p. 77. The author also describes six other recorded spp. of the genus from Cuba.

GEMMINGER (C. H. vi. p. 110) alters *Metriorrhynchus*, Guér., to *Metriophthalmus*, and (p. 119) *Emplectus pectinatus* (F. nec L.) to *fabricii*.

Calopteron. Kirsch (B. E. Z. xiv.) describes the following new species: — *C. melanurus* and *nigricauda*, p. 377, *posticus* and *melanozanthus*, p. 378, *thoracicus*, p. 379, *ocularis*, p. 380, Bogotá (the last queried as doubtfully belonging to the genus).

Calopteron pectinicornis, sp. n., Chevrolat, l. c. p. 74, Guadeloupe; *C. (?) semiflavum*, sp. n., Chevrolat, l. c. p. 78, Cuba.

Dictyopectera porphyrophora, sp. n., Solsky, Hor. Ent. Ross. vii. p. 366, E. Siberia.

Eros antennalis, sp. n., Kirsch, l. c. p. 381, Bogotá.

Lampyrides.

GEMMINGER (C. H. vi. pp. 119 & 120) makes the following alterations in nomenclature: — *Lucidota compressicornis* (Sol. nec F.) to *depressicornis*; *L. dimidiatipennis* (Luc. nec Duv.) to *semicolor*; *Photinus albilateralis* (Mots. nec Gyll.) to *albolimbatus*; *P. cinctus* (Mots. nec F.) to *circumcinctus*; *P. interruptus* (Mots. nec Er.) to *divisus*; *P. lucifer* (Er. nec Melsh.) to *erichsoni*; *P. infuscatus* (Mots. nec Cast.) to *intercalatus*; *P. linearis* (Blanch. nec Latr.) to *longus*; *P. californicus* (Mots. Cat. nec Etud. ent.) to *reversus*; *P. vittatus* (F. nec Ol.) to *vitiosus*; *P. vittiger* (Lec. nec Gyll.) to *zonatus*; *Aspidosoma laterale* (Boh. nec F.) to *limbatum*; *A. maculatum* (F. nec Deg.) to *sticticum*; *Lampyris fuscipennis* (Boh. nec Guér.) to *melanoptera*; *L. nigripennis* (Boh. nec Mots.) to *nigrita*; *Luciola apicalis* (Boisd. nec Eschsch.) to *dejeani*; *L. maculicollis* (Muls. et Wach. nec Cast.) to *maculithorax*.

Cladoceras should not be referred to the *Lycides*, but to the *Lampyrides*, next before *Calyptocephalus*, Gray: Kirsch, B. E. Z. xiv. p. 381.

Luciola italica. Targioni-Tozzetti (Bull. Ent. Ital. ii. pp. 177–189, tav. i. & ii.) enters minutely into the structure of the photogenic lamellæ of this sp., giving highly magnified drawings of the component cellules &c.

Photinus pyralis (L.) is figured in its chief stages with detail, and particulars of its economy are given, in Amer. Ent. i. p. 19, f. 9.

Phosphænopterus, g. n., Schaufuss, Nunq. Otios. p. 60 [no comparative diagnosis given]. Sp. *P. metzneri*, sp. n., l. c. p. 61, Portugal. [This genus is simply referred to the *Malacodermata* by its author, who gives the diagnostic characters in French.]

Lampyrus insignis, sp. n., Ancey, L'Ab. vii. p. 86, Lebanon; *L. algerica*, sp. n., Ancey, l. c. p. 87, Blidah.

Cladoceras calvus, sp. n., Kirsch, l. c., Bogotá.

Drilides.

Drilus flavescens. Bellevoye (Ann. Soc. Ent. Fr. 4^e ser. x., Bull. p. xxxv) indicates *Helix pomatia* and *nemoralis*, L., *hortensis*, *fruticum*, and (?) *erectorum*, Müll., as the snails fed upon by the larva of this species. DESMAREST (ibid. p. xxxvi) adds his experience that the ♀ has occurred in *H. nemoralis*, once in *H. pomatia*. DE MARSEUL (Nouv. et faits div., no. 14) adds *H. candidula* to Bellevoye's list; and A. DE PERRIN (ibid.) gives directions for the detection of ♀ *Drilus*, received by him from Lespès.

LUCAS (Ann. Soc. Ent. Fr. 4^e sér. x., Bull. p. lvii) briefly describes the ♀ of a *Malacogaster* from Algiers, the larva of which attacks *Helix dupontii* and *H. lucasi*, and which (having ♂ and ♀) he provisionally names *M. bassi*.

Telephorides.

GEMMINGER (C. H. vi. p. 120) makes the following alterations in nomenclature:—*Telephorus bilineatus* (Boh. nec Say) to *digrammicus*; *T. dichrous* (Mars. nec Lec.) to *dissipatus*; *T. flavipes* (Lec. nec F.) to *gilvipes*; *T. nigripennis* (Sol. nec F.) to *melanopterus*; *T. præcox* (Philippi nec Géné) to *philippini*; *T. planicollis* (Lec. nec Kies.) to *platyderus*; *T. pusillus* (Boh. nec Lec.) to *pusio*; *T. ruficeps* (Kies. nec Blanch.) to *ruficapitatus*; *T. pictus* (Cast. nec Wied) to *sticticus*; *T. tibialis* (Lec. nec Brullé) to *tibiellus*; *T. collaris* (Lec. nec Sol.) to *torquatus*; *T. terminalis* (Redt. nec Cast.) to *ustus*; *T. abdominalis* (Sol. nec F.) to *ventralis*; *T. vitticollis* (Boh. nec Ménét.) to *zonatus*.

Telephorus mandibularis, Kby., = *fraxini*, Say: Lec., Ann. N. H. ser. 4, vi. p. 398.

V. ROTTENBERG (B. E. Z. xiv. p. 241) gives distinguishing characters for *Cantharis immaculicornis*, Cast., and *livida*, L., which he asserts are specifically distinct.

ABEILLE DE PERRIN (Ann. Soc. Ent. Fr. 4^e sér. x. p. 81) describes at full length his *Telephorus cornix*, of which the diagnosis was published in Pet. Nouv., 1 Dec. 1869.

PETTITT (Canad. Ent. ii. p. 117) records an example, from Ontario, of *Podabrus punctatus* (Kirby) with three antennæ; the additional member being placed directly in front of the right antenna, and consisting of 10 joints, with a three-jointed branch from the base of the ninth joint.

A larva, supposed to be that of a *Telephorus*, and proved to feed upon the grubs of the "Plum Curculio" (*Conotrachelus nenuphar*), is described and figured, with detail, in Amer. Ent. i. p. 35, f. 29. This is subsequently (p. 51) discovered to be the larva of *Chauliognathus pennsylvanicus* (De G.), f. 51.

THOMSON (Sk. Col. x. p. 116) describes the hitherto unknown ♂ of his *Malthinus facialis*.

- Telephorus picciolii*, sp. n., Ragusa, Bull. Ent. Ital. ii. p. 316, Palermo.
Cantharis paulinoi, sp. n., v. Kiesenw. B. E. Z. xiv. Beih. p. 125, Coimbra.
Polemia varicornis, sp. n., Kirsch, B. E. Z. xiv. p. 382, Bogotá.
Malthesis. Kirsch, l. c., describes the following new species:—*M. marginicollis*, p. 382, *luridus* and *marginatus*, p. 383, *acuminatus* and *discoideus*, p. 384, Bogotá.
Malthinus dryocetes [sic], sp. n., v. Rottenberg, l. c. p. 242, Sicily.
Malthodes vincens, sp. n., Gredler, C. H. vi. p. 10, Tyrol.

Malachides.

LICHTENSTEIN (Pet. Nouv. 27, p. 108) records *Malachius rufus* from the nests of *Eumenes*.

Malachius miniatus (Reiche nec Kolen.) is changed to *miniaceus*, and *Ebaeus pedicularius* (Schr. nec L.) to *præoccupatus*: Gemminger, C. H. vi. p. 121.

KOLTZE (S. E. Z. xxxi. p. 144) suggests a connexion between *Troglops corniger*, Kies., and flowering lime-trees.

Dasytides.

V. KIESENWETTER (B. E. Z. xiv. Beih. p. 126) describes both sexes of *Henicopus senescens*, Duv., from Andalusia.

CROTCH (Pr. E. Soc. 1870, p. xviii) gives the following synonymy:—*Dasytes* (*Metadasytes*) *plumbeus* (Ill., Thoms., nec Müll.), *cozalis*, Muls., = *oculatus*, Kies.; *D. (M.) flavipes* (Ol., Muls., nec F.), ^p *fuscus* (Thoms. nec Kies.) = *plumbeus* (Müll., Kies.); *D. (M.) subæneus* (Thoms., Crotch, nec Schön.), *plumbeus* (Ol., Fourc., Muls., nec Müll.), *ærosus* (Kies.), *æratu*s, Steph., = *plumbeo-niger* (Goeze); and points out characters for these and allied species.

Dasytes ærosus, Kies., ^p = *subæneus* (Schön.): Thoms., Sk. Col. x. p. 109.

Dolichosoma protensa and *Dasytes oculatus* are recorded as British by Crotch, Pr. E. Soc. 1870, p. xviii.

Haplocnemus pini, Redt., = *impressus* (Msh.): Crotch, C. H. vi. p. 102.

Collops limbatus (Lec. nec Mots.) is changed to *limbellus* by Gemminger, C. H. vi. p. 120.

New species:—

Henicopus heydeni, v. Kiesenw. l. c., Santas Albas and Oviedo.

Dasytes rugipennis, Thomson, Opusc. Ent. fasc. ii. p. 139, Sweden.

Haplocnemus marginatus, v. Rottenberg, B. E. Z. xiv. p. 243, Sicily; *H. rufomarginatus*, Perris, L'Ab. vii. p. 18, Tenès; *H. koziorowicki*, Desbr. des Loges, *ibid.* p. 122, Corsica.

Haplamaurus marginalis, Kirsch, B. E. Z. xiv. p. 369, Bogotá.

Dasytiscus medius, v. Rottenb. l. c. p. 244, Sicily.

Danacea kiesenwetteri, v. Heyden, B. E. Z. xiv. Beih. p. 127, Ronda; *D. lusitana*, v. Heyd. *ibid.*, Coimbra.

CLERIDÆ.

Tillus elegans (Roth, nec Er.) is changed to *elegantulus*; *Epiclides gayi* (Spin. nec Chevr.) to *spinolæ*; *Hydnocera scabra* (Mots. nec Lec.) to *scabripennis*: Gemminger, C. H. vi. p. 121.

Clerus sobrius, Walk., = *sphegeus*, F.: Lec., Ann. N. H. ser. 4, vi. p. 401.

LICHTENSTEIN (Pet. Nouv. 27, p. 108) notes having bred *Trichodes leucopsideus* from dry bramble-stems, the beetle being parasitic on *Ceratina callosa* and *C. cyanea* (Hymenop.).

Aphelocerus, g. n., Kirsch, B. E. Z. xiv. p. 369. Group of *Tyllides*: tarsi 5-jointed; head short, oval; antennæ 11-jointed, simple; eyes convex, finely granulate, acutely emarginate in front. Sp. *A. sturnus*, sp. n., Kirsch, l. c. p. 370, Bogotá.

CUPESIDÆ.

Cupes clathratus, sp. n., Solsky, Hor. Ent. Ross. vii. p. 370, E. Siberia.

PTINIDÆ.

PERRIS (Ann. Soc. Ent. Fr. 4^e sér. ix. p. 467) quotes an account by Revelière of the damage done to collections of insects by larvæ of *Anobium paniceum* in Corsica [England might have been substituted with equal correctness as the locality].

DUNNING (Pr. E. Soc. 1870, p. xxxiii) records the larva and imago of *Anobium paniceum* as devouring Cayenne pepper.

The larva of *Anobium paniceum* is recorded as injurious to tea, particularly scented orange Pekoe: Ent. 82, p. 162.

SHIMER (Amer. Ent. & Bot. ii. pp. 322-324), in an article on "Book-worms," describes and figures *Anobium paniceum* (F.) and *Ptinus frontalis* (Mels., = *brunneus*, Dufts.), f. 200.

BECKER (Bull. Mosc. xlii. p. 183) notes the occurrence of (?) *Ptilinus grandicollis*, Fald., in furniture made of walnut.

GEMMINGER, *ibid.*, makes the following alterations in nomenclature:—*Brachytrachelus* (Moraw., nec Schön.) to *Trachelobrachys*, p. 124; *Ptilinus aspericollis* (Muls., nec Ménét.) to *asperulus*, p. 121.

Ptinus obesus, Luc., = *pulchellus*, Boield., ♀: v. Rottenberg, B. E. Z. xiv. p. 245.

RYE (Ent. M. M. vi. p. 183) corrects an erroneous record of *Microptinus gonospermi* (Du V.) as British.

ABEILLE DE PERRIN (Ann. Soc. Ent. Fr. 4^e sér. x. p. 82) describes at full length his *Ptinus auberti*, of which the diagnosis was published in Pet. Nouv., 1 Dec. 1869.

Pseudodrilus, g. n., Motschoulsky, Bull. Mosc. xlii. p. 272. Intermediate in form between *Drilus*, *Anobium*, and *Xyletinus*, very elongate, slightly depressed; antennæ very elongate and compressed, strongly serrate; mandibles square, penult. joint of all tarsi simple. Sp. *P. mamillatus*, sp. n., Mots. l. c. p. 274, Steppes of Kirguises. Figured on pl. ii. of the enumeration of "*Carabiques nouveaux*" of the author's collection, f. 5.

Anobium (*Dendrobium*) *carpetanum*, sp. n., v. Heyd. l. c. p. 129, Escorial.

Ptinus corticinus, sp. n., v. Rottenb. l. c. p. 245, Sicily (♀ = var. *brunneus*, Dufts., teste auct.).

Eurostus (*Ptinus*) *minimus*, sp. n., v. Heyden, B. E. Z. xiv. Beih. p. 128, Serra de Gerez.

BOSTRYCHIDÆ.

Bostrychus bicaudatus, Say, known in N. America as the "Apple-twig borer," is figured, and its habits are described, in Amer. Ent. i. p. 80, f. 69.

SPHINDIDÆ.

Sphindus dubius (Gyll.)=*hispidus* (Payk.): Thoms., Sk. Col. x. p. 43.

CIOIDÆ.

Cis villosus (Marsh.) ?=*plagiatus*, Thoms.: Thoms. l. c. p. 45.

CROTCH (C. H. vi. p. 112) comments upon G. R. Waterhouse's paper on *Cis* (Tr. E. Soc. v. 1859) with regard to the Marshamian spp., of which he considers that *C. pyrrocephalus* must stand for *setiger*, Mell., and *ruficornis* for *oblongus*, Mell.

Cis microgonus, sp. n., Thoms. l. c. p. 46, and *C. puncticollis*, sp. n., Thoms., Opusc. Ent. fasc. ii. p. 136, Sweden.

MELASOMATA.

Zophosides.

Zophosis nitidula (Mots. nec Sol.) is changed to *steppensis*: Gemminger, C. H. vi. p. 121.

Erodiides.

Zophorus bremeri (Guér., Brême), *insignis* (Blanch.), and *moreleti* (Luc.)=*chilensis* (Gray); *Z. mexicanus* (Sol. nec Hope)=*jourdani* (Sallé); *Z. variolosus* (Stm.)=*nodulosus* (Sol.); *Z. variolosus* (Haldem.), *nodulosus* (Lec. & Horne)=*haldemanni* (Sallé); *Z. pectoralis* (Lec.)=*nervosus* (Sol.): Sallé, C. H. vi. p. 113.

Adesmides.

Adesmia reticulata (Gerst. nec Klug) is changed to *reticularis*, and *Stenocara longipes* (Ol. nec F.) to *herbsti*: Gemminger, *ibid.*

Tentyrides.

MOTSCHOULSKY (Bull. Mosc. xliii.) describes, amongst others, the following species, which, from the want of references, given in all other instances, would appear to be new; some of them, however, were certainly described by the author in Bull. Mosc. xviii. 1845.

Rhostax convexicollis, p. 379, Steppes of Kirguises (an erroneous reference is given to figures of this species, which creates a further doubt whether the sp. be here described for the first time); *Microdera excavata*, p. 382, pl. iii. figs. 6 & 7, Steppes of Kirguises; *Tentyria valida*, p. 382, pl. iii. f. 6 (no locality given); *T. robusta*, p. 383, f. 8, Novo-Alexandrovska (?=*gigas*, Fald., ♂); *T. ovalis*, *ibid.*, f. 9, Steppes of Kirguises; *T. ventralis*, p. 384, f. 11, Steppes of Dschungorie; *Anatolica curtula*, p. 388, Dschungorie; *A. gnathosoides*, p. 389, pl. iv. figs. 4 & 5, Sarepta; *A. coriacea*, p. 389, figs. 6 & 7, Steppes between Volga and Don; *A. saisanensis*, Dschungorie, and *A. albovittis*, Steppes of Kirguises, figs. 24 & 25, p. 396; *Mesostena valida*, Egypt, *M. armeniaca*, Armenia, and *M. bramini*, E. Indies, p. 397; *M. rufa*, p. 398, Egypt.

MOTSCHOULSKY (l. c. pl. iii.) gives figures in outline of *Microdera deplanata* (Gebl.), figs. 1 & 2; *M. deserta* (Tausch.), figs. 3 & 4; *M. campestris*

(Stev.) f. 5; *Tentyria reflexa* (Fisch.), f. 7; *T. sibirica*, Gebl., f. 10; *Anatolica longicollis* (Zubk.), f. 12; *A. tatarica* (Gebl.), f. 13; *A. thoracica* (Fisch.), figs. 14 & 15; *A. impressa* (Tausch.), f. 16; *A. lineata* (Stev.), figs. 17 & 18; *A. abbreviata* (Gebl.), pl. iv. figs. 1 & 2; *A. atramentaria* (Fald.), pl. iii. figs. 20 & 22; *A. denticulata* (Gebl.), pl. iv. f. 8; *A. constricta* (Stev.), *ib.* figs. 9 & 10; *A. macrocephala* (Tausch.), *ib.* figs. 11 & 12; *A. pigmæa* [sic] (Gebl.), pl. iii. figs. 24 & 25; *A. bella* (Fald.), pl. iv. figs. 13 & 14; *A. sulciceps* (Gebl.), *ib.* figs. 15 & 16; *A. angulosa* (Fisch.), pl. iii. figs. 26 & 28; *A. strigosa* (Gebl.), pl. iv. figs. 17 & 19; *A. angustata* (Gebl.), *ib.* f. 20; *A. lata* (Gebl.), *ib.* figs. 26 & 28. References of figures of other allied species are given to a plate 2 in former Bull. Mosc., accompanying the enumeration "des *Carabiques nouveaux*" of the author's collection.

KRAATZ (Hor. Ent. Ross. vii. p. 407) suggests that *Capnisa elliptica* (Becker nec Mén.) = *karelini*, Fald. Solsky, *ibid.*, corroborates this opinion, from an examination of the types of both spp.

Tentyria heydeni, sp. n., Haag, B. E. Z. xiv. Beih. p. 130, Aveiro.

Epitragides.

HAAG-RUTENBERG (C. H. vi. p. 84 *et seq.*) tabulates and describes 13 spp. of *Himatismus*, Er., giving his reasons (p. 92) for not accepting De Marseul's genus *Cyphostetha* (which Gemminger, C. H. vi. p. 111, sinks as a syn. of *Himatismus*): he describes the following new spp.:—*H. laticollis*, p. 87, Angola; *dubius*, p. 88, and *senegalensis*, p. 89, Senegal; *villosus*, Egypt, Angola, and *punctatissimus*, Angola, p. 90; *epitragoides*, p. 91, Zanzibar.

Adelostomides.

Steira ægyptiaca, sp. n., Kirsch, B. E. Z. xiv. p. 389, Egypt.

Stenosides.

Stenosis angustata (Hbst. nec F.) is changed to *coarctata*: Gemminger, C. H. vi. p. 121.

Dichillus socius, sp. n., v. Rottenb. B. E. Z. xiv. p. 247, Sicily.

Centriopterides.

Amblycyphus, g. n., Mots., Bull. Mosc. xliii. p. 401. Closely allied to *Centrioptera* (Mann.), but with a retractile labrum, more distinctly toothed mandibles, the penult. joint of ant. not transverse, more obtuse elytral asperities, &c. Also allied to *Asbolus* (Lec.), which is of shorter form, with tuberculiform elytral asperities, very transverse penult. joint of ant., more visible labrum, &c. Sp. *A. asperatus* (Mots.).

Threnus, g. n., Mots. *ibid.* p. 404. Allied to *Cerenopus*, but with clubbed antennæ, the elytra not widened behind, a less advanced epistoma, and with the projections of the tibiæ and femora edentate. Sp. *T. niger* (Mots.).

Scaurides.

Scaurus punctatus (Hbst. nec F.) is changed to *sticticus*: Gemminger, C. H. vi. p. 121. *S. variolosus*, Woll., is identical with this sp., according to Crotch; but its characters, possibly of a specific value, are pointed out by Wollaston, Ann. N. H. ser. 4, v. p. 249.

Blaptides.

GEMMINGER, *l. c.* pp. 121 & 122, makes the following changes:—*Blaps caudata* (Sol. nec Gebl.) to *caudigera*; *B. convexa* (Reiche nec Fisch., if Fischer's sp. be not *abbreviata*, Ménét.) to *mutata*; *B. laticollis* (Redt. nec Sol.) to *platythorax*; *B. variolosa* (Fisch., Spic. p. 104, nec Fald.) to *variolata*; *B. variolosa* (Fisch. *ibid.* p. 89, nec Fald.) to *variolaris*; *Elæodes sulcata* (Lec. nec Esch.) to *lecontei*; *E. obscura* (Sol. nec Say) to *tenebricosa*.

Elæodes convexicollis, Walk., = *obscura* (Say), ♀, of which sp. *conjuncta*, Walk., is the ♂; *E. binotata*, Walk., ? = *hispilabris* (Say), of which *sulcata*, Lec., is a syn.: Lec., Ann. N. H. ser. 4, vi. p. 401.

Asidides.

Asida rugosa (F.), changed to *fabricii* by Allard, on account of *rugosa* (Fourc., 1785), need not have been altered on the date alone, as Fabricius's original description appeared in 1775; *sabulosa* (Goeze, 1777) would have had priority over Fourcroy if change required: v. HAROLD (Pet. Nouv. 16, p. 61).

Asida morbillosa (Dufts. nec F.) is changed to *duftschmidi* by Gemminger, C. H. vi. p. 122.

Pycnomorpha, g. n., Mots., Bull. Mosc. xliii. p. 398. Resembles *Stenomorpha*, Sol., but has a transverse labrum, more obtuse mandibles, a less projecting ligula, unclothed legs, elytra carinated towards the sides, and prominent thorax. Sp. *P. californica* (Mots.) and ? *Scotera gibbosa* (Esch., Dej. Cat.).

Psilomera, g. n., Mots. *l. c.* p. 400. Differs from *Pelecyphorus* in its narrow form and smooth surface. Sp. *P. (Pelecyp.) angulatus* (Lec.).

Asida diecki, Barcelona, and *A. anceyi*, Syria, spp. nn., Allard: (diagnoses only) Pet. Nouv. 1 Jan. 1870, p. 50.

Nycteliides.

Nyctelia granulata (Curt. nec Waterh.) is changed to *granulosa*, *N. plicata* (Blanch. nec Waterh.) to *plicipennis*, and *Epipedonota rugosa* (Sol. nec Waterh.) to *rugulosa*: Gemminger, C. H. vi. p. 122.

Pimeliides.

Pimelia rugulosa, Germ., and *sardea*, Sol. v. Rottenberg, B. E. Z. xiv. p. 248, inclines to consider these insects conspecific.

BLACKMORE (Pr. E. Soc. 1870, p. xxix) records a monstrosity of *Pimelia scabrosa* from Tangiers, in which the right antenna was doubly furcate.

Molurides.

Psanmodes grandis (Sol., Cat. nec Mem. Ac. Tor.) is changed to *gravis*, and *P. plicatus* (Sol., Cat. nec M. A. Tor.) to *plicipennis*: Gemminger, C. H. vi. p. 122.

Sepidides.

Praocis (Guérin, 1841) and *Platesthes* (G. R. Waterh., 1845) are identical;

but Lacordaire is wrong in referring the *P. silphoides* of the latter to the *P. depressa* of the former: C. O. Waterhouse, Ent. M. M. vi. p. 284.

Sepidium reichei, sp. n., Allard; diagnosis in Pet. Nouv., 1 Jan. 1870, Tunis, Algeria, &c.

Vieta (errore *Vieta*) *algeriana*, sp. n., Allard; diagn. in Pet. Nouv., 1 Jan. 1870, Algeria.

Crypticides.

Crypticus zophosioides, sp. n., v. Heyden, B. E. Z. xiv. Beih. p. 131, Spain and Portugal; *C. sibiricus*, sp. n., Solsky, Hor. Ent. Ross. vii. p. 373, E. Siberia.

Pedinides.

Pedinus longulus, sp. n., v. Rottenberg, B. E. Z. xiv. p. 249, Sicily.

Hopatrides.

GEMMINGER (C. H. vi.) makes the following changes:—*Loboderus* (Muls. & Rey nec Guér.) to *Lobothorax*; *Hopatum setulosum* (Küst. nec Fald.) to *trichopterum*; *H. patrule* (Küst. nec Er.) to *vicinum*.

The larva and pupa of *Hopatum sabulosum* are briefly described by Lucas (Ann. Soc. Ent. Fr. 4^e sér. x. p. lxxxii).

Isostira, g. n., Pascoe, Ann. N. H. ser. 4, v. p. 97. Differs from *Hopatum* in its clypeus being entire at the apex, and its labrum being transverse and not sinuate. Sp. *I. crenata*, sp. n., Pasc. l. c. p. 98, Queensland.

Hopatum validum, sp. n., v. Rottenberg, B. E. Z. xiv. p. 250, t. ii. f. 2, *H. messeniaceum*, sp. n., p. 251, t. ii. f. 1 & 1a, Sicily; *H. grenieri*, sp. n., Perris, L'Ab. vii. p. 19, Corsica.

Gonocephalum ussuriense, sp. n., Solsky, Hor. ent. Ross. vii. p. 374, E. Siberia.

Trachyscelides.

PASCOE (Ann. N. H. ser. 4, v. p. 95) tabulates the 12 known genera of this group, noting that Duval is the only author who has given the correct number of 10 joints to the antennæ of *Trachyscelis*.

Scymæna amphibia, sp. n., Pasc. l. c. p. 94, K. George's Sound.

Bolitophagides.

Bolitophagus gibbifer, Wesm., has nothing to do with *Byrsax cœnosus*, Pascoe; its generic position is as yet undecided. P. de Borre, Ann. E. Belg. xiii. c.-r. p. x.

Usechus, Mots., has nothing to do with *Rhagodera*, Er., Mann., as Lacordaire states, but is to be placed near *Ulodes*. Motschoulsky, Bull. Mosc. xliii. p. 406.

Mychestes, g. n., Pascoe, Ann. N. H. ser. 4, v. p. 96. Antennæ clavate, 10-jointed, club biarticulate; ant. tibie subfusiform; elytra ovate, metast. very short. Sp. *M. lignarius*, sp. n., Pasc. l. c. p. 97, Queensland.

Byrsax saccharatus, sp. n., Pascoe, l. c. p. 95, Queensland.

Diaperides.

GEMMINGER (C. H. vi. p. 111) withdraws his alteration of *Platydemia picipes* (Cast. et Brullé) into *vicinum*, as Say's *picipes* is a *Phaleria*. He makes the following further changes:—*Encephalus* (Brême nec Westw.) to *Encara*, p. 124; *Platydemia histrio* (Er. nec Cast. & Br.) to *histrionicum*; *P. maculatum* (Thoms. nec Cast. & Br.) to *macularium*; *P. variegatum* (Klug nec Cast. & Br.) to *variipenne* (p. 122).

Platydemia pallens, Lap., is certainly, and *P. 4-maculata*, *P. cyanea*, *Hoploccephala chalybea* and *H. collaris*, Lap., are most probably to be withdrawn from the list of N. American spp.; the first of them is S. American: Leconte, Ann. N. H. ser. 4, vi. p. 404.

v. ROTTENBERG (B. E. Z. xiv. p. 252, t. ii. f. 3) redescribes and figures *Halonotus subplumbeus*, Fairm., from Sicily.

Ulomides.

Uloa ferruginea (Montr. nec Say) is changed to *ferruginis*: Gemminger, C. H. vi. p. 122.

Heleïdes.

Saragus carinatus, De Br., and possibly *S. sulphoides*, De B., = *simplex* (Hope): Pascoe, Ann. N. H. ser. 4, v. p. 102.

Pterohelaeus arcamus, sp. n., Pascoe, l. c. p. 98, and *P. asellus*, sp. n., Pasc. *ibid.* p. 99, Queensland.

Helaeus mastersi, sp. n., Pascoe, *ibid.*, W. Australia (Salt River).

Saragus. Pascoe, l. c., describes the following new spp.:—*S. floccosus*, p. 100, Queensland [*vide supra*, p. 253, as to fungoid growth on this sp.]; *S. patelliformis*, *ibid.*, W. Austr.; *S. incisus*, N. S. Wales, and *S. asperipes*, S. Austr., p. 101; *S. conformatus*, p. 102, W. Austr.

Tenebrionides.

Iphthimus servilis, *I. servator*, and *I. subligatus*, Walk., = *serratus* (Mann.), type and var.: Lec., Ann. N. H. ser. 4, vi. p. 401.

Ezerestus, g. n., F. Bates, Ent. M. M. vi. p. 268. No long hook to inner lobe of max.; cheeks enormously extended in length, epistoma declivous, eyes small and narrow. Allied to *Zophobas*. Sp. *E. jansonii*, sp. n., F. Bates, l. c. p. 269, pl. ii. figs. 1, 1a, Nicaragua.

Hipalmus, g. n., F. Bates, l. c. p. 269. Also allied to *Zophobas*, but with prost. process much more strongly produced and pointed behind, and mesosternum subhorizontal. Sp. *H. (Tenebrio) costatus* (Guérin), pl. ii. fig. 2.

Dilamus [= *Boromorphus*, Wollast.] *congener*, sp. n., v. Rottenberg, B. E. Z. xiv. p. 250, Algiers, Spain.

Zophobas concolor, sp. n., Wollaston, Ann. N. H. ser. 4, v. p. 33, St. Helena [? = *Helops morio*, F., *teste auct.*].

Tenebrio paivæ, sp. n., Wollast. l. c. v. p. 249, Fogo, C.-Verdes.

Cnodalonides.

Tarpela, g. n., F. Bates, l. c. p. 272. Allied to *Nautes*, Pasc., but with the mesost. declivous and broadly excavated in front, and the prost. bent down behind the ant. coxæ. Sp. *T. brownii*, sp. n., F. Bates, *ibid.* 1870. [VOL. VII.]

pl. ii. fig. 4, Nicaragua; *T. oblongopunctata*, sp. n., F. Bates, l. c. p. 273, Mexico.

Elomosda, g. n., F. Bates, *ibid.* p. 273. Facies of certain *Helopides*; and, but for its elongate metast., probably near *Hegemona*. Thighs clavate, antennæ long and slender; with a deep furrow bordering and extending posteriorly beyond the eyes. To be placed near *Camaria*. Sp. *E. belti*, sp. n., F. Bates, l. c. p. 275, pl. ii. fig. 3, ♂.

Nautes, Pasc. F. Bates, l. c., describes the following new spp.:—*N. ceneus*, p. 270, and *N. eximius*, p. 271, Nicaragua; *N. ovatus*, Colombia, and *N. elegans* (no loc. given), p. 271.

Helopides.

Helops azureus (Montr. nec Brullé) is changed to *azureonitens*, *H. congener*, (Woll. nec Reiche) to *conformis*, *H. quisquilius* (F. nec L.) to *fabricii*, *H. gibbicollis* (Küst. nec Fald.) to *gibbithorax*, *H. punctipennis* (Lec. nec Luc.) to *punctatus*, *Hedyphanes helopioides* (Luc. nec Fald.) to *helopinus*: Gemminger, C. H. vi. p. 123.

Helops inclusus, Walk., from description = either *lautus* or *pernitens*, Lec.: Lec., Ann. N. H. ser. 4, vi. p. 401.

Helops. KRAATZ (B. E. Z. xiv. Beih. p. 136) briefly characterizes the 3 pubescent species of this genus found in Spain and Algiers. The same author (l. c. p. 139, note) enumerates 16 spp. of *Helops* found in South Spain, and already recorded.

KRAATZ (l. c. p. 142, note) remarks upon the error in de Marseul's Cat. ed. 2, in attributing *Nephodes metallescens*, Küst., as a var. to *N. villiger*, Rosenh., the latter having been (in Kraatz's opinion, wrongly) described as probably a var. of the former; he also notes the still greater error in De Mars. Cat., 1866, wherefrom *metallescens* is entirely omitted.

The type given by Lacordaire (*carbonarius*, Kl.) for the genus *Hoplonyx* (*Oplocheirus*, Dj.) does not accord with the generic characters given: Schaufuss, Nunq. Otios. p. 62.

Heliohygus sulcatus (Sol. nec Guér.) is changed to *sulcatulus*: Gemminger, C. H. vi. p. 123.

Penthe funerea, Newm., = *pimelia* (F.), according to Suffrian (S. E. Z. xxxi. p. 298), who enters fully upon the characters &c. of this sp., and of *P. obliquata* (F.).

Parablops, g. n., v. Rottenberg, B. E. Z. xiv. p. 254, t. ii. f. 7 a-c. Allied to *Nephodes*, Rosh., in the structure of legs and parts of the mouth, but separable from all its allies by its flatter build, posteriorly dilated elytra, and flatter and uneven thorax. Sp. *P. ætnensis*, sp. n., v. Rottenb. l. c. p. 256, t. ii. f. 7, Sicily.

New species:—

Helops. Kraatz, l. c., describes the following new species:—*H. dieckii*, p. 132, Arragon; *estrellensis*, p. 133, Sabogueiro; *lusitanus*, p. 134, Serra de Gerez and Bussaco; *piligerus*, p. 135, Andalusia; *macellus*, p. 136, Algesiras; *montanus*, p. 137, Guarda; *sublinearis*, p. 139, South of Spain.

Omolipus cyaneus, Pascoe, Ann. N. H. ser. 4, v. p. 98, K. George's Sound.

Adelium geminatum, Pascoe, l. c. p. 102, Queensland.

Licinoma elata, Pasc. l. c. p. 103, Queensland.

Dinoria celioides, Pasc. *ibid.*, Queensland.

Seirotiana mastersii and *S. nosodermoides*, Pasc. *l. c.* p. 104, Queensland.

Polytropus tuberculatus, Kirsch, B. E. Z. xiv. p. 370, Bogotá.

Hoplonyx micans, Schauf. *l. c.* p. 62, *H. latus* and *angusticollis*, *ibid.* p. 63, Natal.

Nephodes modestus, Ktz. *l. c.* p. 142, Arragon.

Hedyphanes mesostena, Solsky, Hor. Ent. Ross. vii. p. 376, E. Siberia.

Amarygmides.

Eurypera, g. n., Pascoe, Ann. N. H. ser. 4, v. p. 106. Allied to *Amarygmus*, but with a shorter and more convex body, and terminal joint of labial palpi so large as nearly to cover the labium. Sp. *E. cuprea*, sp. n., Pasc. *ibid.*, Queensland.

Amarygmus tyrrhenus, sp. n., Pascoe, *l. c.* p. 105, W. Australia; *A. marulius*, sp. n., Pasc. *ibid.*, N. S. Wales; *A. variolaris*, sp. n., Pasc. *l. c.* p. 106, Queensland.

Strongyliades.

Strongylium longipenne (Mäkl. nec Murray) is changed to *mählini*: Gemminger, C. H. vi. p. 123.

CISTELIDÆ.

Isomira. v. KIESENWETTER (B. E. Z. xiv. Beih. p. 143, note) enumerates certain Spanish and Portuguese species of this genus. v. HEYDEN (*ibid.* p. 144, note) also refers to other Spanish species. He finds nothing to separate *I. acuminata*, Fairm. (1866) from *I. ovulum*, Kies. (1861).

Isomira acuminipennis is recorded from Gibraltar by Crotch (Pet. Nouv. 13, p. 49).

[H] *Omophlus*. P. de Borre (L'Ab. vii. pp. 43-83) translates into French the monograph by Kirsch of this genus (B. E. Z. xiii. pp. 97-128).

Cistela (*Isomira*) *genistæ*, sp. n., v. Rottenberg, B. E. Z. xiv. p. 256, t. ii. f. 4, Sicily; *C. (I.) parvula*, sp. n., v. Rott. *l. c.* p. 257, note, t. ii. f. 5, Naples.

Isomira hispanica, sp. n., v. Kiesenw. *l. c.* p. 143, Spain; *I. estrellana*, sp. n., v. Kies. *l. c.* p. 144, Serra Estrella.

[H] *Omophlus fallaciosus*, sp. n., v. Rottenb. *l. c.* p. 258, Sicily.

PYTHIDÆ.

Homalorhinus (Chevr. nec Ménét.) is changed to *Rhinomalus*: Gemminger, C. H. vi. p. 124.

ABEILLE DE PERRIN (L'Ab. vii. p. 89), without referring to his original publication of the species in Pet. Nouv. no. 11, 1 Dec. 1869, describes at full length his *Salpingus exsanguis* as new.

MELANDRYADÆ.

CHAPMAN (Ent. M. M. vi. pp. 259-261) gives particulars of the economy and a description of the larva of *Abdera bifasciata* (cf. Tr. Woolh. Cl. 1870, pp. 161-163).

Orchesia fusiformis, sp. n., Solsky, Hor. Ent. Ross. vii. p. 377, E. Siberia.

LAGRIADÆ.

v. KIESENWETTER (B. E. Z. xiv. Beih. p. 145) describes the ♂ of *Lagria grenieri*, Bris., from Spain and Portugal.

PEDILIDÆ.

Xylophilus fasciatus (Boh. nec Melsh.) is changed to *undatus*: Gemminger, C. H. vi. p. 123.

Xylophilus brevicornis, sp. n., Perris, L'Ab. vii. p. 20, Sos (Lot-et-Gar.).

Scryptia nigriceps, sp. n., v. Heyden, B. E. Z. xiv. Beih. p. 145, Andalusia.

ANTHICIDÆ.

Notoxus bicoronatus, Bedel, = *excisus*, Küst., nec *cavifrons*, Laf.: Bedel, in Pet. Nouv. 20, p. 81.

v. KIESENWETTER (B. E. Z. xiv. Beih. p. 149) refers to *Anthicus paykullii*, Gyll., and *ghilianii*, *aubei*, and *andalusiacus*, Laf., from South Spain. He re-describes *A. versicolor*, sibi.

Anthicus melanarius, Schm., ? = *setulosus*, Thoms.: Thomson, Sk. Col. x. p. 146.

Anthicus dichrous (Montr. nec Laf.) is changed to *bicoloratus*, *A. transversalis* (Laf. nec Villa) to *mutatus*, *A. formicarius* (Nietn. nec Laf.) to *myrmecodes*: Gemminger, C. H. vi. p. 123.

Notoxus impezus, sp. n., v. Kies. l. c. p. 146, Seville.

Tomoderus piochardi, sp. n., v. Heyden, B. E. Z. xiv. Beih. p. 147, Serra Estrella and Gerez.

Anthicus bruckii, sp. n., v. Kies. l. c. p. 147, Gibraltar; *A. ophthalmicus*, sp. n., v. Rottenberg, B. E. Z. xiv. p. 259, t. ii. f. 6, Sicily; *A. constricticollis*, Desbr. des Loges, L'Ab. vii. p. 124, Algeria.

MORDELLIDÆ.

Mordella albosignata (Boh. nec Muls.) is changed to *albosparsa*: Gemminger, C. H. vi. p. 123.

PERRIS (Ann. Soc. Ent. Fr. 4^e sér. ix. p. 466) records the larvæ of *Mordellistena grisea* in stems of *Artemisia vulgaris*, and of *M. inæqualis* in those of *Daucus carotta*, upon the medullary substances of which they feed, without doubt; he thinks Goureau probably wrong in attributing the destruction of larvæ of *Lixus* and *Agromyza*, found in stems of *Senecio aquatica*, to the larva of *M. subtruncata*. The larvæ of *Mordellistena* are formed nearly as in *Mordella*, certainly lignivorous; those of *Anaspis* like certain *Cryptophagide*, and live on detritus of other xylophagous larvæ and are perhaps carnivorous: Perris (*ibid.*).

Mordella mellissiana, sp. n., Wollaston, Ann. N. H. ser. 4, v. p. 35, St. Helena.

Mordellistena rectangula, sp. n., Thoms., Skand. Col. x. p. 134, Sweden.

Anaspis subtilis, sp. n., Hampe, B. E. Z. xiv. p. 333, Siebenbürgen.

Silaria picta, sp. n., Hampe, l. c. Steiermark.

STYLOPIDÆ.

v. SIEBOLD (Z. wiss. Zool. xx. Hft. 2, pp. 243-247) discusses the ques-

tion of pædogenesis in *Xenos rossii*, the parasite of *Polistes gallica*. KRAATZ (B. E. Z. xiv. p. 48) recapitulates his observations, resulting in the conviction that the ovaries of the ♀ perfect insect do not arrive at their proper development, owing to the ♀ remaining as a larva for her whole existence, and that eggs capable of development are produced without previous fecundation, from which eggs, probably, ♂ insects proceed. [The *Stylopidæ* are noticed among the *Coleoptera* against the Recorder's convictions.]

RHIPIPHORIDÆ.

Rhipiphorus paradoxus. The economy of this species is very fully discussed in various papers by Murray, Smith, and Chapman, in vols. v. and vi. Ann. N. H. ser. 4. Murray, *l. c.* v. p. 83 *et seq.*, adheres to his former opinion that the larva does not feed on wasp-grubs, considering the instances adduced by Smith to arise from some error of observation. Chapman, *ibid.* p. 191 *et seq.*, supports Smith's views, differing only from him in his idea as to the mode of oviposition, which Chapman thinks, with Denison, takes place when the wasp-grub covers itself in its cell, the beetle-larva, as soon as hatched, devouring the grub by suction, and undergoing its metamorphoses in the cell, thus forming a parallel to the relations of *Chrysis* and *Odynerus*. The very rapid feeding-up of the beetle-larva, as in *Chrysis*, has been the cause of the difficulty in elucidating the history of *Rhipiphorus*, in Chapman's opinion. Smith, *ibid.* p. 198 *et seq.*, reasserts his original position, and adduces evidence in refutation of Murray's points, and in corroboration of Stone's views. Murray, *l. c.* vi. p. 204, having in the interval made numerous observations, retracts his former opinion, and is fully convinced that the *Rhipiphorus* is a parasite. From his experience, the egg is laid on the wall of the wasp's cell, just within its lip, and the young larva sucks the wasp-grub, taking from 8 to 10 days to consume it, and averaging 3 or 4 days before hatching. He describes the larva of *Rhipiphorus*, and (pl. xiv.) figures it with detail, giving also views of the wasp-grub both by itself and in connexion with the parasite. Chapman, *ibid.* p. 314 *et seq.*, also describes the larva very fully, especially as to its earliest conditions. He fails to find the egg, but discovers the larva to be at first a minute black hexapod, *Meloe*-like, which enters the wasp-grub (even before the latter has spun its silken covering before assuming the pupal state) at the back of the primary dorsal segments, feeding internally in the general cavity of the body, and emerging probably within 6 hours after the spinning up of the grub, when it changes its skin, and becomes shorter, thicker, and curved in front. It then attaches itself to the upper extremity of the grub, and feeds by suction, changing its skin a second time, and finally devouring the grub almost entirely. The perfect insect seems to emerge about two days after the wasps of the same row of cells; and its eye-spots were found

by Chapman in the head of a feeding larva. The young external larva seems to differ from the coleopterous type only in not having a spiracle on the 12th segment; and the full-grown larva closely resembles that of a *Crabro* or *Pemphredon* (Hym.). Chapman (pl. xvi.) figures the larva at different stages and in different aspects, with highly magnified details. Murray, *ibid.* p. 326 *et seq.*, supplements Chapman's observations by an account of the method of oviposition employed by a *Rhipiphorus* bred by him, the egg, which is much smaller than the wasp-egg, being laid with a drop of gummy thread against the side of a box in which the beetle was kept.

Emenadia biguttata (Gerst. nec Blanch.) is changed to *biguttula* [*? biguttulata*]: Gemminger, C. H. vi. p. 123.

CANTHARIDÆ.

Meloides.

M'NAB (Ent. M. M. vii. p. 149) records *Meloe decorus*, Brandt, from England. There seems, however, some doubt as to the correct determination of the species.

SMITH (Pr. E. Soc. 1870, p. xxxii) makes further observations upon the habits of *Meloe rugosus*.

PASCOE (*ibid.*) refers to impalement of *Meloe maialis* on spines of *Cactus opuntia* near Narbonne, not the work of *Lanius*.

Megetra cancellata, Lec. nec Er., = *vittata*, Lec., var.: Lec., Ann. N. H. ser. 4, vi. p. 404.

Mylabrides.

DE MARSEUL (L'Ab. vii. 1870) commences a monograph of the European members of this subfamily, of which he proposes to describe 137 species, 28 of them being treated as new. He divides them into 3 groups, after the number of the joints in their antennæ, viz. *Mylabris*, with 11 joints, *Decatoma*, with 10, and *Coryna*, with 9,—*Mylabris* consisting of 3 subgenera—*Lydoceras* (erected by the author at p. 12 for the reception of *fasciata*, Fab., on account of its subuliform antennæ, as in *Lydus*, Latr.), *Mylabris* proper, and *Ceroctis* (erected by the author for 2 African and Asian species, in which the antennæ, especially in the ♂, are serrate and pectinate).

DE MARSEUL, *l. c.*, gives the following synonymy:—*M. duplicata*, Klug, = *zonata*, Kl., ♀; *scapularis*, Kl., ? = *æstuans*, Kl., var.; *matthesi*, Fald., = *cincta*, Ol.; *superba*, Fald., = *6-maculata*, Ol.; *vicina* and *affinis*, Luc., = *silbermanni*, Chev.; *suspiciosa*, Rosenh., = *hieracii*, Graëlls, var.; *inconstans* and *10-spilota* Chev., = *varians*, Gyll.; *niligena*, Reiche, and *maura*, Chev., = *calida*, Pall.; *goudoti*, Cast., & *scapularis*, Chev., = *circumflexa*, Chev., varr.; *angulata*, Kl., = *gilvipes*, Chev.; *wagneri*, Chev., = *curta*, Chev.; *confluens*, Fisch., = *marginata*, Fisch.; and describes the following new species:—*M. abiadensis*,

p. 29, *ligata*, p. 31, *dubiosa*, p. 35, Egypt; *baubnyi*, p. 49, Algeria; *ledereri*, p. 57, Asia Minor; *javeti*, p. 63, Persia; *filicornis*, p. 64, Egypt; *tauricola*, p. 73, Syria, Taurus; *zebræa*, p. 79, Asia Minor; *fimbriata*, p. 83, Egypt; *euphratica*, p. 84, Persia; *goryi*, p. 88, Persia; *lævicollis*, p. 109, Caucasus; *concolor*, p. 112, Asia Minor; *batnensis*, p. 121, Algeria; *signata* (Fald., but ? described before), p. 129, Persia; 14-*signata* (Heyd. MS.), p. 133, *gratiosa* (Chevr. MS.), p. 135, and *lactea*, p. 140, Egypt; *audoini*, p. 141, Kirghises; *ægyptiaca*, p. 142, and *tigripennis*, p. 143, Egypt.

Mylabris alterna (Walk. nec Cast.) is changed to *alternata*, *M. phalerata* (Er. nec Pall.) to *angolensis*, *M. 12-guttata* (Er. nec Germ.) to *erichsoni*: Gemminger, C. H. vi. p. 123.

Cantharides.

Tetraonyx flavipennis (Sol. nec Guér.) is changed to *xanthopterus*, *Cantharis chalybea* (Lec. nec Er.) to *chalybeata*, *C. germari* (Hald. nec Fisch.) to *mutata*, *C. limbata* (Koll. & Redt. nec Klug) to *nimbata*, *C. femoralis* (Lec. nec Klug) to *femorata*, *C. rubriceps* (Koll. & Redt. nec Blanch.) to *reversa*, *Nematognatha bicolor*, (Luc. nec Lec.) to *lucasi*: Gemminger, C. H. vi. pp. 123 & 124.

Nem(at)ognatha bicolor, Walk., = *apicalis*, Lec., var.: Lec., Ann. N. H. ser. 4, vi. p. 402.

FINKH (Württ. JH. xxvi. p. 365) notes the occurrence of *Cantharis vesicatoria* in Wurtemberg.

Lytta immerita, Walk., is an *Epicauta*: Lec., Ann. N. H. ser. 4, vi. p. 401.

Lytta vittata (F.), *L. cinerea* (F.), *L. murina*, Lec., and *L. marginata* (F.) are figured, and details of their economy, as regards the potato, given in Amer. Ent. i. pp. 23-25, figs. 13-15.

Schaufuss (Nunq. Otios. pp. 46 & 47) redescribes his *Sitaris lativentris* and *S. splendida*.

Abeille de Perrin (Ann. Soc. Ent. Fr. 4. sér. x. p. 84) describes at full length his *Sitaris nitidicollis*, of which the diagnosis was published in Pet. Nouv. 1 Dec. 1869.

Lagorina palestina, sp. n., Kirsch, B. E. Z. xiv. p. 390, Jericho.

Zonitis haroldi, sp. n., v. Heyden, B. E. Z. xiv. Beih. p. 150, Madrid.

Sitaris tenuicornis, sp. n., Schauf. l. c. p. 47, Cairo.

CEdemerIDÆ.

Anonca chinensis (Boh. nec Hope) is changed to *sinensis*, and *Cedemera ventralis* (Schm. nec Ménét.) to *schmidtii*: Gemminger, C. H. vi. p. 124.

Anoncodes croceiventris, Mots., = *coarctata* (Geb.): Solsky, Hor. Ent. Ross. vi. p. 381.

v. ROTTENBERG (B. E. Z. xiv. p. 260) notes Sicilian vars. of *Mycterus umbellatarum* (Fab.), and doubts the specific distinctness of *M. pulverulentus* and *tibialis* (Küst.).

CURCULIONIDÆ.

Brachyderides.

SEIDLITZ (B. E. Z. xiv. Beih. p. 154) records dark examples of *Strophosomus retusus* (Marsh.) from Portugal; and criticises Chevrolat's description of his *S. flavipes* (p. 155). He describes certain new species of *Strophosomus* already indicated by him in B. E. Z. xiv. p. 379 *et seq.*

SCHAUFUSS (Nunq. Otios. p. 48) redescribes his *Thylacites pratensis* and *Strophosomus beticus*.

Thylacites nignidus, Germ., = *rubi* (Gyll.), and is not a *Polydrosus*, but a *Sciaphilus*: Thomson, Sk. Col., x. p. 176.

Damage to peas by *Sitones lineatus* and *S. flavescens* is noticed in Ent. 79, p. 117.

PASCOR (Tr. Ent. Soc. 1870, pp. 13-40) tabulates and describes 39 spp. of the Australian genus *Catasarcus*, of which all but 5 are treated as new. He refers to an exudation, in the form of small grains, as if sprinkled with sand, and to a waxy varnish, apparently part of the true integument, occurring in certain of these species.

Ochrometa, g. n., Pascoe, P. L. S. x. p. 449. An isolated genus, according to the author. Sp. *O. amana*, sp. n., Pasc. l. c. p. 450, pl. xvii. f. 6, W. Australia.

Enasus, g. n., Pascoe, *ibid.* p. 470. Allied to *Cneorhinus*, but with the facies of *Strophosomus*. Sp. *Æ. sellifer*, sp. n., Pasc. l. c. p. 471, pl. xviii. f. 12, Old Calabar.

Eutinophæa, g. n., Pascoe, Tr. E. Soc. 1870, p. 181. Near *Foucartia*, Duv. Scrobe straight and transverse, lying between the eye and mouth, but rather nearer the former. Sp. *E. nana*, sp. n., Pasc. l. c. p. 182, pl. v. figs. 6 a & 6 b, S. Australia.

Evas, g. n., Pascoe, *ibid.* p. 182. Differs from *Prosayleus* in its cylindrical prothorax and shorter fore legs. Sp. *E. crassirostris*, sp. n., S. Austr.; *argenteiventris*, sp. n., Queensland; *acuminata*, sp. n., K. George's Sound: Pascoe, l. c. p. 183.

New species:—

Cneorhinus cordubensis, Kirsch, B. E. Z. xiv. Beih. p. 173, Cordova.

Strophosomus. Seidlitz (l. c.) describes the following new species:—*S. globulus*, p. 153, Coimbra and Leon; (*Neliocarus*) *ebenista*, *ibid.*, Castille, Arragon; (*N.*) *formosus*, p. 154, Serra Estrella; (*N.*) *ovulum*, *ibid.*, Brañuelas; (*N.*) *sagitta*, p. 155, Valencia and Algesiras.

Sciaphilus maculatus, Hampe, B. E. Z. xiv. p. 334, Agram; *S. cæsius*, Hampe, l. c. p. 335, Siebenbürgen.

Brachyderes quercus, Bell. de la Chavig., Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xxvi, Lower Alps.

Barypithes vellestris, Hampe, l. c. p. 334, Brünn.

Sitones brucki, Allard, B. E. Z. xiv. Beih. p. 156, Malaga; *S. allardi*, Kirsch, B. E. Z. xiv. p. 390, Egypt; *S. circumductus*, Desbr. des Loges, Mitth. schweiz. ent. Ges. iii. p. 193, S. Russia; *S. punctiger*, Thoms., Skand. Col. x. p. 167, Sweden [*P. = puncticollis*, Steph.]; *S. hispanicus*, Allard (diag. only), Pet. Nouv., 1 Jan. 1870, p. 50, Seville.

Polydrosus subglaber, *variegatus*, and *alveolus*, Desbr. des Loges, B. E. Z. xiv. Beih. p. 157, Sierra Nevada; *P. binotatus*, Thoms. l. c. p. 340, Sweden.

Catasarcus. Pascoe, l. c., describes the following new species:—*C. suturalis*, p. 18, *opimus*, p. 19, *griseus*, p. 22, *pollinosus*, p. 23, *ceratus*, p. 24, *bellicosus*, p. 28, *humerosus*, p. 30, *carbo*, p. 35, W. Australia; *longicornis*, p. 20, *vinosus* and *effloratus*, p. 21, *foveatus*, p. 24, *intermedius*, p. 27, *echidna*, p. 28, *araneus* and *albuminosus*, p. 29, *funereus*, p. 31, *brevicollis* and *marginispinis*, p. 32, *capito*, p. 33, *ochraceus*, p. 34, *albiparsus*, p. 35, *cicatricosus*, p. 36, *scordalus*

and *ericius*, p. 37, *trapa*, p. 38, *furfuraceus* and *lepidus*, p. 39, *tribulus*, p. 40, Champion Bay; *maculatus*, p. 25, K. George's Sound; *memnonius*, p. 26, Victoria; *ovinus*, *ibid.*, and *concretus*, p. 38, Queensland; *nitidulus*, p. 30, Swan River.

Rhadinomus impressus, Pascoe, P. L. S. x. p. 448, W. Australia; and *R. lacordairei*, Pasc. *ibid.*, p. 449, Queensland.

Compseus rugosus, Taschenb., Z. ges. Naturw. 1870, Bd. i. p. 188, Bogotá.

Otiiorhynchides.

Otiiorhynchus septentrionis (Hbst.) = *scaber* (L.): Thomson, Sk. Col. x. p. 174.

Trachyphleus scaber, auct., is named *rostratus*: Thoms. l. c. p. 175.

RYE (Ent. M. M. vii. p. 149) records *Trachyphleus myrmecophilus*, Seidl., from the south of England, noting also the occurrence in England of a second (and apparently undescribed) species of *Cathormiocerus*. He considers the characters of the latter group insufficient for generic distinction.

CBOTCH (Pr. E. Soc. 1870, p. xv) records *Trachyphleus laticollis*, Sch., as British.

SEIDLITZ (Nouv. et faits div., no. 16) notes omissions in description of *Trachyphleus maculatus*, Perris, and *coloratus*, All., which he hints may both be synonymous with *laticollis*, Sch. *Omius lepidotus*, Perris, according to him, cannot be an *Omius*, because of its squamosity; and it cannot be determined, from the description, whether it is a *Platytrarsus*, *Ptochus*, *Foucartia*, or *Scaphilus bellus*.

Proxyrus, g. n., Pascoe, P. L. S. x. p. 437. Intercostal process relatively narrow. Sp. *P. abstersus*, sp. n., pl. xvii. f. 8, and *P. lecidiosus*, sp. n., Pascoe, l. c. p. 438, W. Australia.

Zyrcosa, g. n., Pascoe, l. c. p. 438. Belongs to Lacordaire's *Episomides*, but with a transverse thorax, narrowed in front, and strongly angulated at the sides towards the bisinuate base, and the ant. angles of elytra oblique. Sp. *Z. murrayi*, sp. n., Pascoe, l. c. p. 439, pl. xvii. f. 7, Old Calabar.

Euphalia, g. n., Pascoe, l. c. p. 467. Metast. comparatively elongate, scrobes and eyes above approximated. *E. pardalis*, sp. n., Pasc. l. c. p. 468, pl. xix. f. 14, W. Australia.

Atmesia, g. n., Pascoe, l. c. p. 468. Metast. excessively short; scrobes more terminal than in *Euphalia*, and eye nearly round. Sp. *A. marginata*, sp. n., Pasc. l. c. p. 469, pl. xviii. f. 3, S. Australia.

New species :—

Otiiorhynchus planophthalmus, v. Heyden, B. E. Z. xiv. Beih. p. 151, Sierra Nevada; *O. tenuicornis*, Miller, Verh. z.-b. Ges. W. xx. p. 219, Lower Styrian Alps; *O. egregius*, Miller, l. c. p. 220, Thale Gadjyna, Carpathians.

Troglorhynchus camaldulensis, v. Rottenberg, B. E. Z. xiv. p. 40, Naples.

Trachyphleus maculatus, Perris, L'Ab. vii. p. 21, Sardinia.

Elytrurus caudatus, sp. n., Pascoe, l. c. p. 471, pl. xviii. f. 5, Fiji Isles.

Eremnides.

Pephricus, g. n., Pascoe, Tr. E. Soc. 1870, p. 184. Its single-clawed tarsi distinguish it from *Mandalotus*, Er., the only genus to which it may be allied. Sp. *P. echinys*, sp. n., Pasc. *ibid.* pl. 5. f. 7 a, W. Australia.

Platytrachelus chloris, sp. n., Pascoe, P. L. S. x. p. 468, W. Australia.

Leptopsides.

PASCOE characterizes the following new genera and species:—

Demimæa, P. L. S. x. p. 440. Apparently allied to the *Strangalisodides* of Lacordaire (no differential characters given). Sp. *D. luctuosa*, p. 441, pl. xvii. f. 3, Burmah.

Essolithna, p. 457. Closely resembles *Polyphrades* in habit, but with one clawed tarsi. Sp. *E. pluvialis*, pl. xviii. f. 7, and *E. rhombus*, p. 458, W. Australia.

Onesorus, p. 483. Its nearest ally is *Catasarcus*. Sp. *O. maculosus*, pl. xix. f. 13, Cape York, *O. obesus*, W. Australia, *O. tigrinus*, Australia, p. 483; *O. candidus*, Australia, p. 484.

Esmelina, p. 484. Differs from *Polyphrades*, Sch., in its short scape, unequal claws, and possessing a scutellum. Sp. *E. flavovittata*, ibid. pl. xix. f. 8, ? Queensland.

Gyponychus, p. 485. Prothoracic lobe almost non-existent; tarsal claw single; metathoracic episterna completely hidden by the elytra. Sp. *G. porosus*, ibid. pl. xix. f. 10, Mozambique.

Lysizone, ibid. Characters of *Onesorus*, but the scrobes are apical, almost straight behind, but little impressed, terminating before the eyes. Sp. *L. alternata*, p. 486, W. Australia.

Baryopadus, Tr. E. Soc. 1870, p. 186. Tarsi ciliate or setulose beneath, the penultimate joint with narrow lobes. Sp. *B. corrugatus*, ibid. pl. v. f. 5, a, b, Queensland.

Chaodius, p. 187. Differs from *Polyphrades* in its ant. coxæ not being contiguous, and its uniunguiculate tarsi. Sp. *C. nigrescens*, ibid. pl. v. f. 13, W. Australia.

Zymaus, p. 449. Allied to *Leptops*, but with connate claws. Sp. *Z. binodosus*, ibid. pl. vii. f. 5, 5 a, Queensland.

Polyteles decussatus, P. L. S. x. p. 441, pl. xvii. f. 1, Peru.

Leptops colossus, p. 451, *duboulayi*, p. 452, *dorsatus* and *acerbus*, p. 453, W. Australia; *retusus* and *superciliaris*, p. 452, *ebeninus*, p. 454, Queensland; *polyacanthus*, p. 453, Australia; *reductus*, Tr. E. Soc. 1870, p. 185, Australia; *ferus* and *subfasciatus*, ibid., Queensland.

Cherrus vestitus, l. c. p. 209, Queensland.

Polyphrades pusillus and *ortyx*, l. c. p. 446, *amphiatius*, p. 447, *latipennis*, p. 448, W. Australia; *biplagiatus*, p. 447, Queensland; *pardalotus*, p. 447, *æsalon*, p. 448, Queensland.

Byrsopsides.

ALLARD (B. E. Z. xiv. Beih. p. 185 *et seq.*) tabulates and describes the European species, which are comprised in two genera, *Rhytirhinus* and *Gronops*. In Taf. i. he gives outlines of the bodies of 20 out of the 23 members of the former genus. [England, in which *Gronops lunatus* is widely distributed, is omitted from the list of localities given for that species.]

Rhytirhinus impressicollis, Luc., from Algiers, is doubted as being identical with Boh. & Schönherr's species of that name from France. Kraatz, B. E. Z. xiv. p. 272.

Gronops seminiger, sp. n., All. l. c. p. 205, Alsace. [? = *lunatus*, var.]

Synthocus nigropictus, sp. n., Pascoe, P. L. S. x. p. 463, pl. xix. f. 11, Dammaraland; *S. adustus*, sp. n., Pasc. l. c. p. 464, N'gami.

Amycterides.

Dialeptopus, g. n., Pascoe, Tr. E. Soc. 1870, p. 450. Prothorax deeply longitudinally excavated, crested on each side, with its apex projected considerably over the head; elytra tuberculate, with strongly produced spiniform shoulders. Sp. *D. collaris* (Boh., Schön.; *Amycterus*); *D. sepidioides*, sp. n., Pasc. *ibid.* pl. vii. f. 4, W. Australia; *D. ferreus* and *macilentus*, S. Australia, and *D. monachus*, N. S. Wales, spp. nn., Pasc. *l. c.* p. 451.

Melanegis, g. n., Pascoe, *l. c.* p. 452. Allied to *Euomus*, but with the elytra flattened above, and the tarsi narrow and tomentose beneath. Sp. *M. stygius*, sp. n., Pasc. *ibid.* pl. vii. f. 6, K. George's Sound.

Tetralophus incanus and *T. elevatus*, Victoria; *T. excursus*, S. Australia spp. nn., Pasc. *l. c.* p. 453.

Amorphorhinus polyacanthus, sp. n., Pasc. *l. c.* p. 454, W. Australia.

Rhyparosomides.

Zephyrne, g. n., Pascoe, P. L. S. x. p. 471. Allied to *Dichotrachelus*, but possessing a scutellum, and with a very large second abd. segment. Sp. *Z. sordida*, sp. n., Pascoe, *l. c.* p. 472, pl. xix. f. 12, Australia.

Dysostines, g. n., Pascoe, *l. c.* p. 472. Near *Byrsopages* through its rounded eyes; near *Erepimus* by its scape impinging on the prothorax; and to a certain extent agreeing with *Eupages* in the form of its head and rostrum; but standing alone by the separation of its ant. coxæ. Sp.: *D. valgus*, sp. n., Pasc. *l. c.* p. 473, pl. xix. f. 1, Queensland; *D. hoplostethus* and *fuliginus*, spp. nn., Pasc., Tr. E. Soc. 1870, p. 455, *D. pustulosus* and *pilipes*, spp. nn., Pasc. *ibid.* p. 456, K. George's Sound.

Cylindrorhinides.

Peripagis, g. n., Pascoe, Tr. E. Soc. 1870, p. 187. Allied to *Perperus* and *Pantopæus*, but with well-marked scrobes extending to the eyes, and the base of elytra broader than prothorax. Sp. *P. rufipes*, sp. n., Pasc. *l. c.* p. 188, pl. v. f. 10 a, Australia.

Molytides.

Psaldus, g. n., Pascoe, *ibid.* Resembles *Liosomus*, but with lateral scrobes terminating in front of each eye, and with a well-marked groove beneath and parallel with the scrobe, of which it joins the basal portion. Sp. *P. liosomoides*, sp. n., Pasc. *l. c.* p. 189, K. George's Sound.

Opsittis, g. n., Pascoe, p. 456. Near *Plinthus*, Germ., but with the scrobes oblique and terminating below and away from the eyes. Sp. *O. atomaria*, sp. n., Pasc. *l. c.* p. 457, K. George's Sound.

Anchonus favosus and *A. amplicollis*, spp. nn., Kirsch, B. E. Z. xiv. p. 372, Bogotâ.

Gonipterides.

Acroteriasus, Roelofs, = *Syarbis*, Pasc.: Roelofs, Ann. E. Belg. xiii. c.-r. p. xxxiii.

PASCOE (P. L. S. x.) characterizes the following new genera and species:—

Pantoreites (Schönh. MS.), p. 462 (no comparative characters given). Sp. *P. virgatus*, p. 463, pl. xviii. f. 4, S. Australia; *P. scenicus*, *ibid.*, N. S. Wales.

Bryachus, p. 478. Closely allied to *Oxyops*, but with the funiculus of antennæ stout, gradually incrassate, continued into the club. Sp. *B. squamicollis*, p. 479, Queensland, W. & S. Australia.

Syarbis sciurus and *S. gonipteroides*, p. 444, W. Australia.

Gonipterus ferrugatus and *cinnamomeus*, p. 477, Queensland, *batteatus*, *sepiculhralis*, and *cionoides*, p. 478, S. Australia.

Oxyops aulicus, p. 479, *irrasus*, p. 480, *vitiosus*, *marginalis*, and *arciferus*, p. 481, Queensland; *concretus*, p. 479, N. S. Wales; *crassirostris*, p. 480, and *gemellus*, p. 481, W. Australia; *bilunaris*, p. 480, Gawler; *arctatus*, p. 482, Adelaide.

Hyperides.

Schaufuss (Nunq. Otios. p. 48) redescribes his *Phytonomus corpulentus*, and criticises Capiomont's statement as to its possible identity with *P. fuscatus*, Boh.

Rhynchænus borealis, Gyll., = *Phytonomus dissimilis* (Hbst., Curc.): Thomson, Sk. Col. x. p. 182.

Prophæsia, g. n., Pascoe, Tr. E. Soc. 1870, p. 189. Very near *Hypera* and *Pantoreites* (*Gonipterides*), but to be distinguished from both by its mesost. being produced in front, and from the former by the last three joints only of funiculus being short. Sp. *P. albilatera* and *P. cretata*, spp. nn., Pasc. l. c. p. 190, S. Australia.

Diabathrariides.

Atelicus guttatus, sp. n., Pascoe, l. c. p. 458, Tasmania.

Aterpides.

PASCOE (P. L. S. x.) characterizes the following new genera and species:—*Medicasta*, p. 441. This, with *Ethemaia* and *Methypora*, Pasc., will probably form a distinct subfamily. Sp. *M. leucura*, p. 442, pl. xvii. f. 11, W. Australia.

Rhinoplethes, p. 469. Rostrum more like that of *Rhinaria* than of *Aterpes*; but its ocular lobes place it nearer the latter, while the extremely short metast. differentiates it from both. Sp. *R. foveatus*, ibid., W. Australia.

Iphisaxus, p. 469. Combines a very short metast. with narrow metathoracic episterna; the scape is comparatively long, and the seventh joint of funic. forms part of club. Facies of *Aterpus horrens*. Sp. *I. asper*, p. 470, pl. xix. f. 7, W. Australia.

Cleonides.

Cleonus (*Stephanocleonus*) *guttrulatus*, Gyll., is recorded from Belgium by P. de Borre (Ann. E. Belg. xiii. c.-r. p. xxxvi).

The larva of *Lixus mucronatus* occurs in stems of *Sium latifolium*—Perris (L'Ab. vii. p. 36); that of *L. paraplecticus* in stems of *Enanthe phellandrium*—Bellevoye (Nouv. et faits div., no. 8, p. xxix).

Cleonus raymondi, sp. n., Perris, L'Ab. vii. p. 22, Sardinia.

Lixus marqueti, sp. n., Desb. des Loges, Mitth. schweiz. ent. Ges. iii. p. 190; *L. perparvulus*, sp. n., Desb. d. L. ibid., Toulouse.

Larinus rufipes, sp. n., D. d. Loges, l. c. p. 191, Orient.

Hylobiides.

Pissodes strobili, Redt., = *notatus* (F.); *P. notatus*, Redt., = *validirostris*, Gyll.: Thomson, Sk. Col. x. p. 192.

Hyperomorphus, g. n., Perris, L'Ab. vii. p. 26. Resembles certain spp. of *Hypera* (and still more, perhaps, *Aubeonymus*) in structure, and in its punctuation suggests *Hylobius*, between which and *Lepyrus* the author provisionally places it. Sp. *H. asperatus*, sp. n., Perris, l. c. p. 27, Bastia.

Alphitopis, g. n., Pascoe, Tr. E. Soc. 1870, p. 191. Head and rostrum gradually passing into each other. Sp. *A. nivea*, sp. n., Pasc. *ibid.* pl. v. figs. 14 a, b, c, Champion Bay.

Lexithia, g. n., Pasc. l. c. p. 192. Doubtfully placed in this subfamily; funiculus 6-jointed. Sp. *L. rufipennis*, sp. n., Pasc. *ibid.*, Australia.

Orthorhinus meleagris, sp. n., Pasc. l. c. p. 192, Queensland.

Pissodes rotundicollis, sp. n., D. d. Loges, l. c. p. 191, Russia.

Erihrinides.

Mecinus collaris occurs in galls on *Plantago maritima*, and *M. pyraister* in galls on *P. lanceolata* at Southsea: Moncreaff (Ent. M. M. vi. p. 81).

Bagous nodulosus (Gyll.) is recorded from Britain by Rye (Ent. M. M. vi. p. 257).

New genera:—

Orichora, Pascoe, P. L. S. x. p. 486. Facies of *Tychius*; but the subbasal position of the scrobes and the antennæ differentiate the genus. Sp. *O. trivirgata*, sp. n., Pasc. *ibid.* pl. xix. f. 3, W. Australia.

Desiantha, Pasc., Tr. E. Soc. 1870, p. 193. Allied to *Aoplocnemis*, Sch., but terminal scrobes not united beneath, and claw-joint as long as three preceding. Sp. *D. silacea*, sp. n., Pasc. *ibid.*, S. Australia; *D. caudata*, sp. n., Pasc. l. c. p. 194, Victoria.

Emplexis, Pasc. *ibid.* p. 194. Allied to *Cryptophus*, Er., but with free divaricate claws, stout unarmed femora, subcylindrical thorax, &c. Sp. *E. scolopax*, sp. n., Pasc. *ibid.*, Adelaide; *E. lineigera*, N. S. Wales, and *E. simplex*, S. Australia, spp. nn., Pasc. l. c. p. 195.

Erytema, Pasc. *ibid.* p. 195. Allied to *Erihrinus* and *Storeus*, differing from the former in its truncated intercoxal process, and from the latter in its unarmed femora. Sp. *E. consputa*, sp. n., Pasc. l. c. p. 196, pl. v. f. 9 a, S. Australia; *E. dispersa*, sp. n., Pasc. *ibid.*, W. Australia.

Orpha, Pasc. *ibid.* p. 197. Allied to *Meriphus*, Er., but with scrobes continuous beneath, the club of ant. ovate, anter. coxæ globose, not contiguous, and basal joint of tarsi short and dilated. Sp. *O. flavicornis*, sp. n., Pasc. *ibid.* pl. v. figs. 11 a, b, c, Champion Bay.

New species:—

Erihrinus bilunulatus, Desbr. des Loges, Mitth. schweiz. ent. Ges. iii. p. 192 (no locality given).

Mecinus alternans, Kirsch, B. E. Z. xiv. Beih. p. 178, Granada; *M. schneideri*, Kirsch, B. E. Z. xiv. p. 392, Egypt.

Bagous muticus, Thoms., Skand. Col. x. p. 184; *B. longitarsis*, Thoms. l. c.

p. 185; *B. dilatatus*, Thoms. l. c. p. 342; *B. angustulus*, Thomson, Opusc. Ent. fasc. ii. p. 139, Sweden; *B. costulatus*, Perris, L'Ab. vii. p. 23, Coraica.

Meriphus umbrinus, Pasc., Tr. E. Soc. 1870, p. 193, pl. v. figs. 12 a, 12 b, and *M. guttatus*, Pasc. l. c. p. 197, Queensland.

Myossita melanocephala, Pascoe, l. c. p. 198, W. Australia; *M. cirrifera*, Pasc. *ibid.* pl. v. f. 4, Queensland.

Anoplus setulosus, Kirsch, B. E. Z. xiv. p. 216, Silesia; *A. depilis*, Thomson, Opusc. Ent. fasc. iii. p. 337, Sweden.

Amalactides.

Aphela. Pascoe (l. c. p. 203) now states that the post. tibiae of this genus have cavernous corbels, thus referring it to the present subfamily. He notes the sea-side habits of the species.

Iramine, g. n., Pascoe, l. c. p. 200. The cavernous corbels of post. tibiae place this genus in the *Amalactides*; in habit, however, it agrees better with the *Erirhinides*. Sp. *I. atomaria*, sp. n., Pasc. *ibid.* pl. v. f. 3, Champion Bay.

Brexius, g. n., Pascoe, l. c. p. 201. Ant. coxæ exerted. Sp. *B. murinus*, sp. n., Pasc. *ibid.*, Victoria; *B. angusticollis*, sp. n., Pasc. *ibid.*, Queensland; *B. diversipes*, sp. n., Pasc. l. c. p. 202, Champion Bay.

Tranes monopticus and *T. internatus*, spp. nn., Pascoe, l. c. p. 199, Queensland.

Aphela phalerioides, sp. n., Pasc. l. c. p. 202, ? Queensland; *A. algarum*, sp. n., Pasc. l. c. p. 203, N. S. Wales, Victoria, K. G. Sound.

Oxycorinides.

Metriozena, g. n., Pascoe, P. L. S. x. p. 442. Much the habit of an *Apion*, but with a knot at the base of the claw-joint. Sp. *M. ferricollis*, sp. n., Pasc. l. c. p. 443, pl. xvii. f. 10, Macassar.

Belides.

Cyrotypus, g. n., Pascoe, P. L. S. x. p. 445. Allied to *Isacantha*, Hope, but with rostrum twice the length of head, no antennal scrobes, an irregular subconic tuberculate thorax, and wide, convex, parallel elytra, which are not produced at the base and are rounded at apex. Sp. *C. fascicularis*, sp. n., Pasc. *ibid.* pl. xvii. f. 5, S. Australia.

Agnesiotis, g. n., Pascoe, l. c. p. 474. Facies of the Chilian *Dicordylus helipoides* (Lac.), but closely allied to *Pachyura*, differing chiefly in its narrow convex form and toothed femora. Sp. *A. pilosula*, sp. n., Pasc. *ibid.* pl. xviii. f. 6, Queensland.

Belus plagiatus and *linearis*, Queensland, *serpens*, W. Australia, spp. nn., Pascoe, l. c. p. 475; *B. vetustus*, sp. n., Pasc., Tr. E. Soc. 1870, p. 203, Champion Bay.

Rhinotia cruenta, sp. n., Pascoe, P. L. S. x. p. 476, W. Australia.

Eurhynchides.

Ctenaphides, g. n., Pascoe, *ibid.* p. 476. Closely allied to *Eurhynchus*, but with pectinated antennæ. Sp. *C. porcellus*, sp. n., Pasc. l. c. p. 477, pl. xviii. f. 10, W. Australia.

Eurhynchus scapularis, sp. n., Pasc. Tr. E. Soc. 1870, p. 204, Queensland.

Apionides.

DESBR. DES LOGES (B. E. Z. xiv. Beih. p. 160) redescribes his *Apion heydenii* under the name *cantabricum* (cf. Z. Rec. 1869, p. 276).

Apion. Desb. des Loges (Mittheil. schweiz. ent. Ges. iii.) describes the following spp.:—*A. curtipenne* (no locality given) and *russicum*, Sarepta, p. 179; *interrupto-striatum*, p. 180, Sarepta; *stierlini* (no loc. given), p. 181; *rhomboidale*, p. 182, Austria; *subglabrum*, p. 183, Carinthia; *robustirostre*, p. 184, Algiers; *talpa*, p. 185, Sarepta; *diversum*, p. 186, Corsica; *consanguineum*, p. 187, Rhenish Bavaria; *lethierryi*, p. 188, Batna; *uhagonis*, p. 195, Bilbao; *insolitum*, p. 196, N. France; *distincticolle*, Spain, and *pedemontanum*, Piedmont, p. 197; *elongatissimum*, p. 198, Madrid; *zuberi* and *subconicicolle*, p. 199, and *frater*, p. 200, Sarepta; *egyptiacum*, Egypt, and *caviceps*, Russia, p. 201; *kirschii*, p. 202, Egypt; *neapolitanum*, Abruzzi, and *curtulum*, S. France, p. 203; *kiesenwetteri*, p. 204, Hungary; *laticeps*, p. 205, Russia.

Apion parens, sp. n., Desb. des L., B. E. Z. xiv. Beih. p. 161, Cintra; *A. revelieri*, sp. n., Perris, L'Ab. vii. p. 24, Corsica; *A. nigrosparsum*, sp. n., Suffrian (Chevr.), Arch. f. Nat. xxxvi. p. 230, Cuba.

Attelabides.

Attelabus jekeli, sp. n., Kirsch, B. E. Z. xiv. p. 371, Bogotá; *A. foveipennis*, Suffrian, l. c. p. 228, Cuba.

Rhinomacerides.

Rhynchites multipunctatus, Bach, = *alliarie* (Payk.), Kirsch, B. E. Z. xiv. p. 217; *R. longirostris*, Bach, = *æneovirens* (Msh.), Kirsch, l. c. p. 218. For observations on synonymy of the *R. megacephalus* of Schönherr and Germar, cf. *ibid.*

Rhynchites ursus, Gebl., = *hungaricus*, F., var., of which *longimanus*, Gebl., is probably only a small var.; *R. præustus*, Boh., is Algerian; *Auletes tessoni*, God., taken at Lyons, = *politus*, Boh.; characters are given for *Diodyrhynchus austriacus*, Germ., and *Rhinomacer attelaboides* (F.). Desbr. des Loges, L'Ab. vii. (in Mon. des Magdalinides, pp. 60 & 61).

CROTCH (Ent. 73, pp. 8–11) briefly abstracts from Des Loges's monograph characters for the British spp. of *Rhynchites*.

Rhynchites trifasciatus, sp. n., Suffrian, l. c. p. 229, Cuba.

Scolopterides.

Nyxetes, g. n., Pascoe, P. L. S. x. p. 456. Differs from *Scolopterus* in its antennæ, the scape of which reaches beyond the eye, and of which the funiculus is 6-jointed, with 3 basal joints elongate (the 1st the longest) and the last 3 turbinate, and the club is oblong, its conical prothorax, its elytra being scarcely wider at the base than the prothorax and having no shoulders, and the appendiculate claws of its tarsi. Sp. *N. bidens* (Fab., Curc.), fig. in White, Voy. Erebus & Terror, pl. iii. f. 12.

Erodiscides.

Toxophorus (Schön.), being preoccupied, was changed to *Toxentes* by its author. The latter name, however, was also preoccupied in the *Longicornia*;

and the genus is named *Atemistes* by Pascoe (*l. c.* p. 464), who refers to the habits of certain of the species.

Atemistes longirostris, sp. n., Pasc. *ibid.*, and *A. denticollis*, sp. n., Pascoe, *l. c.* p. 465, pl. xix. f. 6, Brazil.

Erodiscus analis, sp. n., Pasc. *l. c.* p. 465, Brazil.

Magdalinides.

DESBRUCHERS DES LOGES (L'Ab. vii.) monographs the European spp. of *Magdalinus*, describing 23, of which 5 are treated as new. He points out that the claws are not, as stated by Lacordaire, simple in all the spp., *M. carbonarius*, *aterrimus*, and *cerasi* having a small triangular tooth at the base; and that the tarsi are not 4-jointed, as the claws are let into a cavity at the apex of the 4th joint. The author (p. 31) describes a var. of *M. duplicatus*, Germ., under the name *parallelocollis*, from the Eastern Pyrenees, and gives the following synonymy:—*M. heros*, Küst., = *memnonius* (Gyll., Fald.), p. 12; *M. frontalis* (Gyll.), var. ♀, and *punctirostris* (Gyll.), var. ♂, = *violaceus* (Lin.), p. 26; *M. punctipennis*, Küst., and *linearis* (Gyll.), var. B, = *duplicatus*, Germ., p. 29; *M. atrocyaneus*, Boh., Sch., = *carbonarius* (L.), var., p. 37; *M. asphaltinus*, Germ., = *aterrimus* (L.), p. 39.

The following new spp. are described:—*M. heydeni*, p. 21, Frankfort-on-the-Maine, England, Chamounix, Sweden; *cæruleipennis*, p. 24, Austria, Turkey; *striatulus*, p. 32, N. Germany; *miztus*, p. 51, Bavaria; *turcicus*, p. 52, Constantinople.

Anthonomides.

DESBR. DES LOGES (B. E. Z. xiv. Beih. p. 158) describes, under the name of *confusus*, a Portuguese var. of *Orchestes avellanae* (Donov.).

Anthonomus stierlini, sp. n., Desbr. d. L., Mitth. schweiz. ent. Ges. iii. p. 189, Athens; *A. bituberculatus*, sp. n., Thoms., Skand. Col. x. p. 212, Sweden.

Acalyptus fuscipes, sp. n., Thomson, Opusc. Ent. fasc. iii. p. 337, Sweden.

Diapelmus ventralis, sp. n., Pascoe, Tr. E. Soc. 1870, p. 205, W. Australia; *D. erichsoni*, sp. n., Pasc. *ibid.*, S. Australia.

Tychiides.

The insect referred to, Zool. Rec. vi. p. 278, as *Sibinia statices* (Moncreaff, MS.) is *Sibynes sodalis* (Germ.): Rye, Ent. M. M. vi. p. 257.

Tychius bellus, sp. n., Kirsch, B. E. Z. xiv. Beih. p. 174, Andalusia; *T. deliciosus*, sp. n., Perris, L'Ab. vii. p. 26, Sardinia.

Pachytychius beticus, sp. n., Kirsch, *l. c.* p. 175, Andalusia.

Sibynes bipunctatus, sp. n., Kirsch, B. E. Z. xiv. p. 393, Egypt.

Gymnetrides.

RUPERTSBERGER (Verh. z.-b. Ges. Wien, xx. p. 839) records some observations on the economy of *Gymnetron linariae* (Fz.).

PERRIS (L'Ab. vii. p. 36), with regard to Kaltenbach's statement that *Gymnetron antirrhini* lives on *Linaria vulgaris*, states that the insect now usually known by that name lives in the capsules of different spp. of *Verbascum* (especially *V. phlomoides*). He considers either the Paykullian statement of habitat wrong, or that the modern *G. antirrhini* is erroneously named.

Cleopus verbasci (Duf.) = *Gymnetron antirrhini* (auct.); *C. uncinatus* (Duf.) = *aselus* (Gr.), the larva of which lives in stems of *Verbascum*: Perris, *ibid.*

Gymnetron heydenii, sp. n., Desbr. des Loges, B. E. Z. xiv. Beih. p. 158, Alhambra; *G. griseohirtellus*, sp. n., Desb. d. L. l. c. p. 159, Corsica and Serra Estrella.

Læmosaccides.

Læmosaccus brevipennis, sp. n., Pascoe, P. L. S. x. p. 439, and *L. synopticus*, sp. n., Pasc. l. c. p. 440, Queensland; *L. tantulus*, sp. n., Pasc. l. c. p. 439, W. Australia.

Alcidides.

Alcides. Pascoe, l. c., describes the following new species:—*A. saundersii*, p. 459, pl. xix. f. 4, Siam; *magicus*, Cambogia, *delta*, Ceylon, Ceram, Amboyna, *trifidus*, N. China, Japan, Mantchuria, p. 460; *ligatus*, Java, *discedens*, Singapore, Sarawak, *asphaltinus*, Batehian, Gilolo, p. 461; *semperi*, p. 462, Philippines.

Alcides heilipoides, sp. n., Pascoe, Tr. E. Soc. 1870, p. 211, Victoria.

Haplonychides.

Aolles, g. n., Pascoe, P. L. S. x. p. 450. Differs from *Haplonyx* solely in its 6-jointed funiculus and 3-jointed tarsi. *Metatyges*, *Physarchus*, and *Stigastus*, Pasc., should probably also be referred to this subfamily. Sp. *A. rubiginosus* and *A. nuceus*, spp. nn., Pasc. l. c. p. 451, W. Australia.

Haplonyx. Pascoe, l. c., describes the following new spp.:—*H. myrrhatus*, p. 488, *ericeus*, p. 490, *venosus*, *centralis*, and *cionoides*, p. 491, *turtur*, p. 492, S. Australia; *ustipennis*, p. 488, Sydney; *dotatus*, *ibid.*, *lucius*, p. 489, W. Australia; *vestigialis* and *fallaciosus*, p. 489, *majalis* and *scolopax*, p. 490, Queensland.

Metatyges cupreus, sp. n., Pascoe, l. c. p. 443, Gold Coast.

Cholides.

Polyderces dilatatus, sp. n., Taschenb., Z. ges. Naturw. 1870, Bd. i. p. 189, Columbia.

Cryptorhynchides.

Conotrachelus nenuphar, "the plum Curculio." For an account of experiments as to the ovipositing of this N. American pest, see Saunders, Canad. Ent. ii. pp. 137–139 (Extr. of Rep. read at meeting of Fruit Growers' Assoc. Ont.). Remedies are discussed by Riley in Amer. Ent. ii. p. 130. Figures are given of its principal stages, f. 92.

Cryptopharis [= *Torneuma*, Wollast.] *raymondii*, sp. n., Perris, L'Ab. vii. p. 28, Sardinia.

Arthrostenus alternans, sp. n., Kirsch, B. E. Z. xiv. p. 393, Egypt.

PASCOE, P. L. S. x., characterizes the following new genera and species:—

Diaphna, p. 445. Belongs to Lacordaire's subtribe *Ithyporides* (no differential comparison given). Sp. *D. signata*, pl. xvii. f. 4, and *D. auritipennis*, p. 446, Natal.

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Salcus, p. 447. Belongs to Lacordaire's *Tylodides* (no differential comparison given). Sp. *S. globosus*, p. 448, pl. xvii. f. 2, Cape York.

Orphanistes, p. 454. Allied to *Axionicus*, Pasc., but with different antennæ, a longer, depressed rostrum with straight scrobes, and a subhumeral elytral callosity. Sp. *O. eustictus*, ibid. pl. xviii. f. 9, Queensland.

Axionicus, p. 455. Allied to *Euthyrhinus*, but with longer and nearly cylindrical legs, the ant. femora extending considerably beyond the head. Sp. *A. insignis*, ibid. pl. xviii. f. 8, Queensland.

Imalithus, p. 465. Allied to *Anaballus* and *Acalles*, but with a short, broad rostrum, and the head invisible from above. Sp. *I. patella*, p. 446, pl. xix. f. 2, Queensland.

Platytenes, p. 466. Remarkable for the form of its metathoracic episterna and the corresponding outline of the outer margin of the elytra, the flatness of the latter on their upper surface, and the comparative proximity of the antennæ to base of rostrum. Sp. *P. varius*, p. 467, pl. xviii. f. 1, Aru, Macassar, &c.

Aonychus lineatus, p. 443, W. Australia.

Protopalus cristatus, p. 448, Queensland.

Euthyrhinus navicularis, p. 455, W. Australia.

Guioperus variolosus, pl. xviii. f. 2, Columbia, and *G. subpalliatu*s, Cayenne, p. 456.

PASCOE, Tr. E. Soc. 1870, characterizes the following new genera and spp. :—

Decilaus, p. 205. In same group as *Tragopus*, but remarkable for the peculiar squamosity and regular convexity of its upper surface. Sp. *D. squamosus*, p. 206, Pt. Augusta.

Ectithius, p. 207. Allied to *Chætectetorus*, but with metathoracic episterna hidden, large facets to the eyes, &c. Sp. *E. capucinus*, ibid. pl. v. f. 2, Tasmania; *E. cariosus* (Er., *Cryptorh.*).

Bepharus, ibid. Allied to *Sympiezoscetus*, Waterh., but with mesost. at end of pectoral channel raised into a short ridge. Sp. *B. ellipticus*, p. 208, Queensland.

Ampagia, p. 208. Also to be placed near *Sympiezoscetus*, but with mesosternal ridge large and deeply vertical, and showing no trace of vaulted structure. Sp. *A. erinacea*, p. 209, pl. v. f. 1, K. George's Sound.

Euthebus, p. 458. Next to *Melanterius*, Er., but with straight filiform rostrum, and no pectoral channel, which is replaced by a broad excavation between ant. and interm. coxæ. Sp. *E. troglodytes*, p. 459, Queensland.

Imaliodes, p. 460. Near *Tragopus*, but with short thick legs and very short femora. Pectoral channel ending between ant. coxæ. Sp. *I. subfasciatus*, p. 461, pl. vii. f. 2, N. S. Wales; *I. terreus*, ibid., Queensland.

Eleagna, p. 461. Differs from *Tragopus* in the 3 interm. segments of abdomen being subequal, and in its sublinear, stout tarsi, which are setose beneath, and have the third joint entire. Sp. *E. squamibunda*, p. 462, S. Australia.

Paleticus, p. 462. Allied to *Poropterus*, but with no keel formed at junction of pronotum and prosternum. Sp. *P. laticollis*, pl. vii. f. 7, *confinis* and *pedestris*, p. 463, *frontalis* and *invidus*, p. 464, Queensland (the latter also from Gawler, Victoria, and Sydney).

Onidistus, p. 465. Femora clavate and toothed; pectoral channel elongate

and open at apex. Sp. *O. nodipennis*, pl. vii. f. 1, and *araneus*, Queensland, and *odiosus*, K. George's Sound, p. 466 (? also certain spp. of *Tylodes*, Montr., and *Crypt. pacificus*, Fauvel).

Petosiris, p. 467. Allied to the preceding, but with sublinear femora and the pectoral channel cavernous at apex. Sp. *P. subereus*, *ibid.*, Queensland.

Methidrysis, *ibid.* Has no obvious affinities. Sp. *M. afflicta*, p. 468, Queensland.

Miconotus, p. 468. Has no obvious affinities. Facies of some of the *Colydiadae*. Sp. *N. tarphioides*, p. 469, Moreton Bay.

Ephrycus, p. 471. Allied to *Chætectetorus*, Sch., but with finely granulated eyes, the clava of ant. distinct from funic., the femora dentate beneath, and the last joint of the tarsi not setose. Sp. *E. obliquus*, *ibid.*, Tasmania, Melbourne (? also *Cryptorh. infulatus*, Er.).

Metacymia, p. 472. Also allied to *Chætectetorus*, but with finely granulated eyes and the fourth joint of tarsi abbreviated and not setose [no comparison made with the preceding genus]. Sp. *M. marmorea*, *ibid.*, W. Australia.

Achopera, p. 473. Facies of *Metacymia*, but with long claw-joint and coarsely faceted eyes; differing from *Chætectetorus* in the even surface of the prothorax, which is not flattened at the sides, and in the non-setose apical joint of the tarsi. Sp. *A. lachrymosa*, Tasmania, and *A. maculata*, N. S. Wales, *ibid.*; *A. uniformis*, p. 474, Queensland.

Chimades, p. 474. Allied to *Chætectetorus*, but with a distinct triarticulate club, finely granulated eyes, ample subquadrangular elytra, and the femora dentate beneath. Sp. *C. lanosus*, *ibid.*, N. S. Wales.

Menios, p. 475. Differs from *Chætectetorus* in its straight, depressed rostrum, convex thorax, dentate femora, non-squamose fourth tarsal joint, and larger eyes. Sp. *M. internatus*, *ibid.*, Sydney.

Tychreus, *ibid.* Eyes finely granulate; pectoral channel reaching the hinder part of interm. coxæ. Sp. *T. camelus*, p. 476, Tasmania.

Tituacia, p. 476. Separated from *Tychreus* by its extremely short metasternum and coarsely faceted eyes. Sp. *T. ostracion*, p. 477, K. George's Sound.

Anilaus, *ibid.* Lower margin of anterior femora largely dilated. Sp. *A. sordidus*, p. 478, Queensland.

Tyrtæosus, p. 479. Differentiated from *Cryptorhynchus* (typified by *C. lapathi*, auct.) by the structure of the tibiæ, which are sulcate, gradually broader to apex, and with the outer margin of the corbels slightly sloped inwards. Sp. *T. microthorax*, *ibid.*, *lateralis* and *incallidus*, p. 480, Queensland; *vetustus*, p. 480, Victoria; *ustulatus*, p. 481, Tasmania.

Æmethylus, p. 482. Differs from *Cryptorhynchus*, as limited by Lacordaire, in its pectoral channel, which terminates between the anterior coxæ and is cavernous at the apex, and in the larger size of second abdominal segment. Sp. *Æ. lumbaris*, *ibid.* pl. vii. f. 3, Queensland.

Phlæoglymma, p. 483. Comes next to *Enteles*, but resembles *Mecistostylus*. Tibiæ and tarsi short, apex of prothorax projecting, pectoral channel extending between intermediate coxæ, open at apex. Sp. *P. alternans*, *ibid.*, N. S. Wales.

Mecistocerus mastersi, p. 459, N. S. Wales.

Chætectetorus hædulus, p. 470, Queensland; *C. clitella*, *ibid.*, S. Australia;

C. latus, p. 471, N. S. Wales, Victoria. [N.B. The author at p. 478 tabulates the leading generic characters of *Chaetictetorus* and allies.]

Cryptorhynchus stigmaticus, p. 481, Queensland.

Zygopides.

Macrobamon, Lac., = *Odoacis*, Pasc. : Pascoe, Tr. E. Soc. 1870, p. 211.

Chirozetes, g. n., Pascoe, P. L. S. x. p. 447. Distinguished from *Mecopus* by the comparatively wide separation of the ant. coxæ; propectus deeply and narrowly excavated, bicornute (in ♂). Sp. *C. pectorosus*, sp. n., Pasc. *ibid.* pl. xvii. f. 9, Cambodia (cf. *ibid.* p. 473, note).

Hedycera, g. n., Pascoe, l. c. p. 457. Related, not very distantly, to *Piazurus*, but with the metathoracic episterna interposed between the post. coxæ and elytra. Sp. *H. megamera*, sp. n., Pasc. *ibid.* pl. xviii. f. 11, Cayenne.

Agametes, g. n., Pascoe, l. c. p. 473. Distinguished from *Mecopus*, *Chirozetes*, and *Macrobamon* by the similarity of the sexes; approaches *Copturus* in the position of its antennæ and more normal ant. legs. Sp. *A. festiva*, sp. n., Pasc. l. c. p. 474, pl. xix. f. 5, Sarawak, Amboyna, &c.

Telephæa, g. n., Pascoe, l. c. p. 487. Renders a division of Lacordaire's Old-World *Zygopides* necessary, as it agrees with the *Mecopus* group in its very broad metathoracic episterna, but conforms to the New-World spp. in its 6-jointed funiculus and ascending mesothoracic epimera. Sp. *T. laticollis*, sp. n., Pasc. *ibid.* pl. xix. f. 9, Macassar.

Mecopus tipularius, sp. n., Pascoe, Tr. E. Soc. 1870, p. 210, Queensland.

Ceuthorhynchides.

RUPERTSBERGER (Verh. z.-b. Ges. Wien, xx. p. 837) describes the larva of *Cæliodes fuliginosus* (Marsh.) from *Papaver somniferum*, and the larva and pupa of *Ceuthorhynchus robertii*, Sch., from *Rhaphanus raphanistrum*, with general observations on both spp.

Müller (Ent. M. M. vii. p. 37) records some observations supposed to indicate an approach to reflection in *Ceuthorhynchus sulcicollis* (Gyll.).

The larva of *Ceuthorhynchus lycopi* lives in the roots of *Mentha sylvestris* as well as of *Lycopus europæus*. Perris (L'Ab. vii. p. 37).

Injuries to turnip-roots caused by *Ceuthorhynchus contractus* are recorded by Cordeaux (Ent. 76, p. 60).

Ceuthorhynchus sulcicollis (Gyll.) = *pleurostigma* (Marsham); *C. cyanipennis* (Gyll.) = *sulcicollis* (Payk.) : Thoms., Sk. Col. x. p. 202.

Ceuthorhynchus vicinus, Bris., = *triangulum* (Märk., Schön.), teste Brisout : Rye (Ent. M. M. vii. p. 36).

Ceuthorhynchus diecki, sp. n., Ch. Brisout, B. E. Z. xiv. Beih. p. 159, Cordova; *C. stenbergi*, sp. n., Thoms. l. c. x. p. 344, and *C. mölleri*, sp. n., *ibid.* p. 347, Sweden; *C. distinctus*, sp. n., Ch. Bris., L'Ab. vii. p. 42, Pyrenees, England. [Rye (Ent. M. M. vi. p. 228) considers this to be *C. marginatus*, var., as he has a specimen with one funiculus 6- and the other 7-jointed.]

Mecysmoderes consularis, sp. n., Pascoe, l. c. p. 482, Formosa.

Baridiides.

Baridius atricolor, Sch., = *ionicus*, Mill., var. major : H. Brisout (Ann. Soc. Ent. Fr. 4e sér. x. p. 51), who names a minor var. *turcicus*; *B. nitens* (Hbst.), *absinthii* (Pz.) = *picinus*, Germ. [= *laticollis* (Msh.)]; *B. sulcicollis*,

Chevr., *picitarsis*, Boh., = *quadraticollis*, Boh.; *B. gimmerthalii*, Hoch., = *semi-striatus*, Boh.; *B. vestitus*, Perris, = *pallidicornis*, Sch., = *scolopaceus*, Germ., var.: H. Brisout, l. c.

Baridius laticollis (Msh.) is bred plentifully from roots of *Sisymbrium officinale* by Moncreaff (Ent. M. M. vii. p. 81); *B. scolopaceus*, Germ., is recorded by Champion (*ibid.* p. 107) from Kentish coast; and *B. sellatus*, Boh., Sch., from Carthage, by Crotch (Pet. Nouv. 13, p. 49).

SEIDEL (SB. Ges. Isis, 1870, pp. 155 & 156) records the destruction of different varieties of *Brassica oleracea* caused by *Baridius cuprirostris*, near Dresden.

DE MARSEUL (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. lxix) refers to *Baridius picinus* attacking the roots, and *B. chlorizans* and *cuprirostris* the stems, of *Brassica oleracea*.

Baridius trinotatus, Say, "the potato-stalk weevil," is figured in its chief stages, and particulars of its economy are given in Amer. Ent. i. p. 22, f. 12.

A gall upon the grape-vine, caused by *Madarus vitis* (Riley, = *Baridius sesostris*, Lec.), is figured and named *vitis vulnus* in Amer. Ent. ii. p. 104 *et seq.*, f. 70. A new sp. of *Madarus* is indicated at p. 105 by Riley, under the name *ampelopsidos*, as feeding upon leaf-stems of the Virginian creeper. This article is conspicuous as the only instance of "*double entendre*" (in its worst signification) among entomological publications.

Baridius. H. Brisout, l. c., describes the following new spp.:—*B. crinipes*, p. 45, Sarepta, Caucasus (? *loricatus*, Sch.); *sulcipennis*, p. 49, Frankfort-on-the-Maine; *dalmatinus*, p. 53, Dalmatia, Poland, S. France; *limbatus*, p. 56, Sarepta, Andalusia; *tenuirostris*, p. 291, Algeria, Syria; *vicinus*, p. 294, Jerusalem, Beyrouth; *alboguttatus*, *ibid.*, Biskra; *setiferus*, p. 296, Sicily, Algeria.

Baridius dispilatus, sp. n., Solsky, Horæ Ent. Ross. vi. p. 312, Lake Khanka.

Calandrides.

ALLARD (B. E. Z. xiv. Beih. p. 207 *et seq.*) tabulates and describes the European species of *Sphenophorus*; characterizing, under the name *nitens*, a French var. of *S. piceus*, and, under the name *inæqualis*, a var., from France, of *S. abbreviatus*.

For an account of injuries to grain by *Sitophilus oryzae*, cf. Pr. E. Soc. 1870, p. xv.

WESTWOOD (*ibid.* p. xvi) briefly describes the larva of *S. granarius*.

Sphenophorus obliquevittatus, sp. n., Taschenb., Z. ges. Naturw. 1870, Bd. i. p. 190, Ecuador; *S. pumilus*, sp. n., Allard, l. c. p. 210, Algeria (De Marseul, Nouv. et faits div. p. lvii, proposes the name *grandini* for this sp., *pumilus* being preoccupied).

Cossonides.

F. SMITH (Ent. M. M. vii. p. 108) records *Mesites tardii* from N. Devon.

PERRIS (L'Ab. vii. p. 34) briefly notes the larva of *Cossonus linearis*, found in a Canada poplar, and which (like that of *C. ferrugineus*) has upon the stigmata of the first 5 abd. segments certain brown spots, which he considers, with the pseudopodal bristles, to be characteristic of *Cossonus*, since they are not found in *Mesites*, or in any other of the *Rhynchophora*, so far as he knows.

Alaocyba, g. n., Perris, l. c. p. 31. Closely allied to *Raymondia*, but with rostrum much shorter and directed in front, with the antennal scrobes commencing not so near its apex; the scape longer, and joints of funiculus shorter and transverse; the prothorax and elytra dorsally flattened; and without the characteristic punctuation of *Raymondia*. Sp. *A. carinulata*, sp. n., Perris, *ibid.*, Sardinia.

Raymondia longicollis, sp. n., Corsica, and *R. sardoa*, sp. n., Sardinia: Perris, l. c. pp. 29 & 30.

Rhyncolus nitidipennis, sp. n., Thoms., Skand. Col. x. p. 348, Sweden.

SCOLYTIDÆ.

Phloeotribus oleæ is recorded by Westwood (Pr. E. Soc. 1870, p. xxxviii) as feeding in an introduced ash-tree at Halifax.

CHAPMAN (Tr. Woolh. Cl. 1870, pp. 43-48) records the economy of the spp. of *Scolytus* occurring near Abergavenny.

Tomicus nigritus, Gyll., is recorded from Scotland by Sharp, Ent. M. M. vi. p. 266.—*T. marshami*, Rye, = *Dryocetes alni* (Georg): Sharp, *ibid.* (cf. Rye, *ibid.*).

Tomicus bicolor (Hbst.) is recorded from England by Champion, *ibid.* vii. p. 107.

CHAPMAN (Ent. M. M. vii. pp. 103-106, 132-135) gives very full accounts of the economy of *Platypus cylindrus*.

Crypturgus hispidulus, sp. n., Thomson, Opusc. Ent. fasc. iii. p. 338, Sweden.

Bostrichus (Tomicus) judeichii, sp. n., Kirsch, B. E. Z. xiv. p. 388, Urals.

BRENTHIDÆ.

KIRSCH (B. E. Z. xiv. p. 378) alters the name of his genus *Automolus* (B. E. Z. xi.) to *Episphales*, on account of the prior *Automolus*, Burm., in the *Liparetrides*.

Ulocerus bicaudatus, sp. n., Suffrian, Arch. f. Nat. xxxvi. p. 203, Cuba.

Trachelizus tenuis, sp. n., Suffr. l. c. p. 216, *T. linearis*, sp. n., Suffr. l. c. p. 218, *T. simplex*, sp. n., Suffr. l. c. p. 219, Cuba.

Stereodermus exilis, sp. n., Suffr. (Moritz), l. c. p. 220, Cuba.

ANTHRIBIDÆ.

WOLLASTON (Ann. N. H. ser. 4, v. p. 18) records *Araocerus coffeæ* (F., = *fasciculatus*, De G.) from St. Helena, and gives an amended diagnosis of his genus *Notioxenus* (p. 19), which he considers one of the most characteristic and indigenous forms of the *Coleoptera* of that island.

Homœodera, g. n., Woll. l. c. p. 23. Allied to *Notioxenus*, Woll., but with no basal transverse prothoracic line, the antennæ further from the eyes, and the basal joint of post. tarsi less elongate. Sp. *H. rotundipennis*, p. 23, *H. alutaeicollis* and *H. pygmæa*, p. 24, spp. nn., Woll. l. c., St. Helena.

Notioxenus dimidiatus and *N. alutaceus*, spp. nn., Woll. l. c. p. 22, St. Helena; *N. pallipes*, sp. n., Suffrian, Arch. f. Nat. xxxvi. p. 170, Cuba.

Toxonotus trituberculatus, sp. n., Suffr. l. c. p. 172, Cuba.

Eugonus dermestoides, sp. n., Suffr. l. c. p. 176, Cuba.

Tropideres. Suffrian, l. c., describes the following new spp. from Cuba:—*T. modestus*, p. 182, *obsoletus*, p. 184, *gracilicornis*, p. 186, *angulatus*, p. 187,

variolosus, p. 188, *sex- verrucatus*, p. 190, *fuscipennis*, p. 192, *parvulus* and *sordidulus*, p. 193, *griseus* and *letus*, p. 195, *confusus*, p. 198.

BRUCHIDÆ.

SCHAUFFUSS (Nunq. Otios. p. 32) records the Cuban *Bruchus pallidipes*, Sch., from Andalusia.

Damage caused to beans by *Bruchus obsoletus*, Say, is referred to in Amer. Ent. ii. pp. 118 & 125.

Bruchus granarius (Payk.) is figured in its chief stages and its economy referred to (the sp. having been introduced into N. America). *Ibid.* p. 126, f. 85.

Urodon spinicollis, sp. n., Perris, L'Ab. vii. p. 32, Tenès.

Bruchus. Suffrian (Arch. f. Nat. xxxvi.) describes the following new spp. from Cuba:—*B. livens*, p. 154, *xanthopus* and *relictus*, p. 156, *tricolor*, p. 157, *quadratus*, p. 161, *pantherinus*, p. 163.

Bruchus senilis, sp. n., Solsky, Horæ Ent. Ross. vi. p. 310, Lake Khanka; *B. rufobrunneus*, sp. n., Wollaston, Ann. N. H. ser. 4, v. p. 25, and *B. advena*, sp. n., Woll. l. c. p. 26, St. Helena (but described with doubt, as probably introduced).

Spermophagus teniatus, sp. n., Suffr. l. c. p. 167, Cuba.

LONGICORNIA.

H. W. BATES (Tr. E. Soc. 1870, pp. 442–444), who has concluded his work on the *Longicornia* of the Amazons (of which the *Lamiides* were published in Ann. N. H. 1861–66, the *Prionides* in Tr. E. Soc. 1869, p. 37 *et seq.*, and the *Cerambycides* as above, pp. 243–325, and pp. 391–444), gives tables of the genera and species referred to by him from that district, resulting in the following numbers:—*Prionides*, 16 genera, 26 spp.; *Cerambycides*, 104 genera, 288 spp.; *Lamiides*, 101 genera, 365 spp.; giving a total of 221 genera and 679 spp.

MURRAY (Ann. N. H. ser. 4, v. pp. 430–438, vi. pp. 44–56, 161–176, 407–413, and 475–482, pls. ii. & iii.) enumerates and describes some of the species of *Longicornia* known to him from Old Calabar, in continuation of his descriptive catalogue of the *Coleoptera* of that region. Various observations are made in this paper bearing on the author's treatise in P. L. S. xi. on the geographical relations of the chief Coleopterous Faunæ. Murray figures the following species:—Pl. ii. f. 1, *Æme nigrita*; f. 3, *Smodicum ebeninum*; f. 4, *Monohammus thomsoni*; f. 6, *Tragocephala galathea*; f. 8, *Prosopocera myops*; f. 13, *Glenea 5-lineata*; f. 14 & 14a, *G. carneipes*: pl. iii. f. 2 & 2a, *Allogaster annulipes*; f. 5, *Pachystola annulicornis*; f. 7, *Geloharpys murrayi*; f. 9, 9a, b, & c, *Tecton 4-signatum*; f. 10, *Temnoscelis waddellii*; f. 11 & 11a, *Apomempsis bufo*; f. 12 & 12a, *Velleda callizona*.

Prionides.

Macrotoma heros (Dohrn), from the Fiji Islands, is a *Xizuthrus*: H. W. Bates, Pr. E. Soc. 1870, p. xxxv.

MÜLLER (*ibid.* p. xxxviii) records habits of *Ægosoma scabricorne* from Basle.

Sarifer, g. n., Kirsch, B. E. Z. xiv. p. 373. Belongs to the group *Closterides*, but with 11-jointed antennæ, as long as the body, and of which the first joint is incrassate towards the apex, the second semilenticular, the third twice as long as the first, the rest distinctly more elongate, and the last very elongate; joints 3–10 with a very long branchlet on each side. Sp. *S. flavirameus*, sp. n., Kirsch, l. c. p. 374, Bogotá.

Psalidognathus wallisi, sp. n., Taschenb., Z. ges. Naturw. 1870, Bd. i. p. 191; *P. limbatus*, sp. n., Tasch. l. c. p. 192, Ecuador.

Pyrodes angustus, sp. n., Tasch. l. c. p. 193, Ecuador.

Cerambycides.

H. W. BATES (Tr. E. Soc. 1870, pp. 243–325, August, and 391–444, Dec.) concludes his treatise on the *Longicornia* of the Amazons by describing the *Cerambycides*, of which he enumerates 104 genera and 288 spp., many being new. He continues to adopt the classification established by Lacordaire, with trifling modifications.

BATES, l. c., recharacterizes his genera *Atenizus*, p. 243, *Niophis*, p. 244, and *Zathecus*, p. 246, placed by him in the *Eminæ*; places *Obrium amazonicum* (White) without hesitation in *Hesperophanes* (Muls.), p. 259; notes the chief character of the *Torneutides*, Lac., occurring in the widely distant *Chlorida curta*, Thoms., p. 262; describes 4 vars. of *Eburadacrys 6-maculata* (F.) from S. America, p. 270; notes connecting links between *Peribæum*, Thoms., and *Nephalius*, pp. 273, 274; incorporates *Castiale*, Pasc., with the latter, p. 276; refers *Phyton modestum*, White, to *Haruspex*, Thoms., p. 280; amends his genera *Aræstis*, p. 309, *Dodecosis*, p. 310, *Æchmutes*, p. 331, *Chlorethe*, p. 394, *Argyrodines*, p. 408; refers *Euryptera albicollis* (Pasc.) to *Ophistomis*, p. 313; notes Lacordaire's omission of *Sphecomorpha*, Newm., with which *Sphecogaster*, Lac., is probably identical, p. 314; describes ♀ of *Odontocera pæcilopoda*, White, p. 321, and *O. mellea*, Wh., p. 322, and ♂ of *O. compressipes*, Wh., p. 324; refers *Stenopterus braconides*, Perty, to *Isthmiade*, Thoms., and *S. albitarsis* (Klug) and *Odontocera subvestita*, White, to *Phygopoda*, Thoms., p. 327, also *Cer. albicornis*, F., overlooked by authors, to *Orthoschema*, Thoms., p. 391; sinks *Heteropalpus*, Buq., as a syn. of *Cometes*, Serv., p. 440; and gives the following synonymy:—*Styliceps sericans*, Lac., = *Ceragenia amazonica*, Thoms., = *C. sericata*, Pasc., but Lacordaire's genus to be used, p. 263; *Odontocera chrysozone*, White, = *O. (Necyd.) fasciata* (Ol.), p. 324; *Callichroma assimilatam*, White, = *rugicollis*, Guér., p. 334; *Rhopalophora vidua*, Chev., = *atramentaria* (White, Listropt.), p. 403; *Cosmisoma lepieurii*, Buq., = *fasciculatum* (Ol., Sap.), p. 404; *C. semicupreum*, Chev., *subvirescens*, Wh., = *æneicollis*, Er., p. 407; *Trachyderes cayennensis*, Dup., = *succinctus* (L.), p. 430; *T. duponti*, solieri, and *dejeanii*, Dup., *scabricollis*, Dalm., = *bilineatus* (Ol.), p. 433; *Oxymerus lineatus*, Dup., = *rivulosus* (Germ.), p. 435; *Lissonotus abdominalis*, Dup., = *unifuscatus*, Gory, p. 437.

BATES, l. c., characterizes the following new genera and species:—

Sphallenum, p. 253. Allied to *Criodion*, Serv., but with sockets of interm. coxæ closed exteriorly, and antenniferous tubercles contiguous. Sp. *S. puncticolle* and *S. femorale*, spp. n., p. 254, Amazons; *S. tuberosum*, sp. n., p. 255, Tapajos (and probably also *Cer. setosus*, Germ., and *Criod. castanopterum*, Er.; the latter queried as possibly identical with *S. femorale*).

Butherium, p. 255, note. Oblong, nude; antennif. tubercles widely separated at base, 4th joint of ant. not shorter than 5th. Femora simple at apex, interm. and post. tibiæ spinose externally at apex. Interm. acetabula narrowly open. Sp. *B. (Criodion) erythropus* (Luc.).

Melathemma, p. 258. Allied to *Xestia*, Serv., but with long, slender, non-tomentose antennæ, the basal joint of which is short oblong. Sp. *M. polita*, sp. n., *ibid.*, Ega.

Aposphaerion, p. 275. Differs from all others of the *Sphaerinae* in its greatly elongate, almost perfectly cylindrical thorax, without a trace of lateral spine or dorsal inequalities. Sp. *A. longicolle*, sp. n., *ibid.*, Obydos.

Pantonyssus, p. 276. Allied to *Nephalius*, but with interm. and post. femora linear, or nearly so, and with a single long spine externally at apex. Sp. *P. erichsoni* (White; *Sphaerion*); *P. nigriceps*, sp. n., *ibid.* note, Rio Janeiro.

Aphatum, p. 308. Allied to *Phormesium*, but differing from all the *Ibidioninae* in its thorax being wider in front than behind, and with no trace of constriction except near post. margin. Eyes widely distant; antennæ short, and exactly filiform. Sp. *A. rufulum* (White; *Ibidion*).

Stenoptrellus, p. 314. Allied to *Merionæda* and *Stenopterus*, but with the antennæ (♀) setaceous, as long as the body. Sp. *S. culicinus*, sp. n., p. 315, Ega.

Epimehitta, p. 330. Allied to *Tomopterus*, but pilose, with attenuated elytra, which gape widely at suture. Sp. *E. meliponica* and *E. rufiventris*, spp. nn., p. 331, Ega.

Epropetes, p. 400. Allied to the Australian *Ipomoria*, differing chiefly in the extreme relative length of the thorax and in the length and proportions of the antennal joints. Sp. *E. latifascia* (White; *Ozodes*).

Eupempelus, p. 401. Close to *Listroptera*, but of a linear form and with abruptly rounded and truncated apex to the elytra, which have no grey tomentum or curved costæ. Sp. *E. olivaceus*, sp. n., 401, Ega.

Lissozodes, p. 408. Allied to *Ozodes*, Serv., but with smooth, cylindrical thorax, and widely different colour. Sp. *L. basalis* (White, *Cynoderus*).

Phymosia, p. 420. Nearest to *Platyarthron*, Guér., but joints of antennæ quadrangulate, dilate-flattened, thickly ciliate beneath, muzzle short and very thick, mandibles very strong and sharply curved, and antennif. tubercles widely flattened. Sp. *P. ebenina*, sp. n., p. 421, Pará.

Athetesis, p. 428. Differs from (restricted) *Paristemia* in its elongate cylindrical body, wide semioval scutellum, and wide, flat, posteriorly incised mesost. Sp. *A. proliza*, sp. n., *ibid.*, S. Paulo.

Eme picticornis, p. 245, Ega.

Achryson nanum, p. 247, and *A. hirsutulum*, p. 248, Tapajos; *A. picta*, *ibid.*, Pará and Cayenne.

Coccoderus amazonicus, p. 249, Tapajos.

Hammaticherus castaneus, p. 250, note, Brazil; *H. glabricollis*, Ega, and *H. macrus*, Villa Nova, p. 251.

Criodion torticollis, p. 252, Pará; *C. rhinoceros*, p. 253, Tapajos; *C. hirsutum*, *ibid.* note, Bahia.

Xestia nigropicea, Pará, *X. brevipennis*, Ega, *X. glabripennis*, Tapajos, p. 256; *X. ochrotenia*, p. 257, U. Amazonas.

Anoplomerus gracilis, Tapajos and Cayenne, and *A. brachypus*, Pará, p. 260.

Opades vittipennis, p. 261, Ega.

Chlorida fasciata, p. 263, St. Paulo.

Eburia longicollis, p. 264, and *E. costulata*, p. 265, Ega; *E. unicolor*, *ibid.*, Pebas and Venezuela; *E. maculicornis*, S. Brazil, and *E. rogersi*, Minas Geraes, p. 266, note.

Eburodacrys cacica, p. 267, note, and *E. raripila*, p. 270, note, Cayenne; *E. longipilis*, p. 268, and *E. rufispinis*, p. 269, Ega; *E. hirsutula*, *ibid.*, Santarem; *E. arcifera*, p. 271, note, Minas Geraes.

Nyssicus quadrinus, p. 271, Tapajos.

Sphaerion callidoides and *S. ducule*, p. 272, Santarem.

Peribaeum ebeninum, Pebas, and *P. lissonotum*, Tapajos, p. 274.

Nephalus fragilis, p. 274, note, Rio Janeiro.

Mallocera amazonica, p. 278, Ega and Pebas.

Appula nigripes, p. 279, Tapajos.

Haruspez lineolatus, p. 280, *H. ornatus*, p. 281, and *H. pusillus*, p. 282, Santarem; *H. maculicornis*, p. 281, Pará; *H. simplicior*, p. 182, note, Rio Janeiro.

Hemilissa sulcicollis, Ega, and *H. cornuta*, Tapajos, p. 284.

Hexaplon flaveolum, p. 285, Tapajos and Ega; *H. prætermisum*, p. 442, Tapajos.

Gnomidolon rubricolor, p. 286, and *G. dubium*, p. 290, Tapajos; *G. eganum* and *G. picipes*, p. 287, *G. melanosomum*, p. 288, Ega; *G. humerale*, p. 287, Pará.

Octoplon polyzonum and *O. tetrops*, p. 291, *O. unoculum*, p. 292, *O. cinc-tulum*, p. 294, *O. polychromum*, p. 295, *O. rugicollis*, p. 296, and *O. charile*, p. 297, Tapajos; *O. callispilum*, p. 293, Pará; *O. calligrammum*, p. 294, Ega.

Ibidion monostigma, p. 297, *I. rubellum*, p. 298, and *I. digrammum*, p. 299, Tapajos; *I. ædicneme*, p. 298, and *I. sphaerium*, p. 300, St. Paulo; *I. leprieuri*, p. 299, Obydos and Cayenne; *I. dilectum*, p. 299, and *I. lineolatum*, p. 301, Ega.

Compsa histrionica, p. 302, Ega.

Heterachthes decipiens, p. 303, and *H. ægrotus*, p. 305, Ega; *H. corallinus*, *involutus*, and *H. longipilis*, p. 304, and *H. sylphis*, p. 305, Tapajos; *H. deliciosus*, *ibid.*, Obydos.

Cycnidolon binodosum, p. 306, Ega.

Phormesium albinum, p. 307, Tapajos.

Obrium cordicollis, p. 308, Santarem.

Ophistomis bivittatus, p. 311, *O. ochropterus*, *melanostomus*, and *rubricollis*, p. 312, and *O. semifulvus*, p. 313, Ega; *O. paraensis*, p. 311, Pará.

Euryptera atripennis, p. 313, Ega.

Sthelenus braconinus, p. 315, St. Paulo.

Oxylymma telephorina, p. 316, Ega.

Agaoe colon, Pará, *A. malthinoides* and *ruficollis*, Ega, p. 319.

- Ommata aurata*, Villa Nova, and *O. smaragdina*, Ega, p. 320.
- Odontocera chrysostetha*, p. 320, and *O. cercerina*, p. 325, Pará and Ega; *O. dispar*, p. 321, Ega; *O. cinctinervis*, *ibid.*, Ega and Tapajos; *O. ornaticollis*, p. 323, Santarem; *O. furcifera*, *ibid.*, and *O. bisulcata*, p. 326, Tapajos; *O. triliturata*, p. 324, Pará.
- Isthmiade ichneumoniformis*, p. 326, Ega.
- Tomopterus obliquus*, p. 329, Tapajos.
- Callichroma porphyrogenitum*, p. 333, Manaus, R. Negro; *C. brachiale*, p. 334, R. Japurá; *C. aureotinctum*, Santarem, and *C. ocreatum*, Lower Napo, Pebas, p. 335.
- Orthoschema tarnieri*, p. 392, and *O. chryseis*, p. 393, Pará; *O. tenuicorne*, p. 392, and *O. cardinale*, p. 393, Ega; *O. ruficeps* and *O. nigricorne*, *ibid.*, note, S. Brazil.
- Cyllene amazonica*, p. 395, Amazons.
- Neochytus tapajonus*, p. 395, Santarem, Tapajos, Ega.
- Mecometopus rubefactus* and *M. purus*, p. 398, Ega; *M. latecinctus*, *ibid.*, S. Paulo; *M. flavius*, p. 399, Santarem; *M. jansoni*, *ibid.*, note, Chontales, Nicaragua.
- Dihammophora nitidicollis*, S. Paulo, and *D. pusilla*, Villa Nova, p. 403.
- Cosmisoma diana*, p. 404 (? = *ammiralis*, L.), *C. argyreum* and *C. lineellum*, p. 405, Ega; *C. pulcherrimum*, p. 406, S. Paulo; *C. humerale*, p. 407, note, Brazil; *C. titania*, *ibid.*, Chontales, Nicaragua.
- Ozodes infuscatus* and *O. ibidiinus*, p. 409, Tapajos; *O. multituberculatus*, *ibid.* note, Chontales; *O. malthinoides*, p. 410, Ega.
- Mallosoma rubricolle*, p. 410, Tapajos.
- Chrysopraxis auronitens*, p. 411, and *C. nigriventris*, p. 413, Pará; *C. sthenias*, p. 411, Ega and S. Paulo; *C. rotundicollis*, *ibid.*, and *C. nana*, p. 414, Tapajos; *C. ruficoxis*, p. 412, Obydos, Villa Nova, Ega, S. Paulo; *C. longicornis*, *ibid.*, Ega and Villa Nova; *C. auripes*, p. 413, S. Paulo; *C. punctulata*, *ibid.*, Cameta, Tocantins; *C. ignea*, *ibid.*, note, Cayenne; *C. melanostetha*, p. 414, U. & L. Amazons; *C. floralis*, Santarem and Tapajos, *C. brevicornis*, Tapajos, Ega, S. Paulo, *C. sobrina*, U. Amazons, p. 415; *C. hispidula*, p. 416, Ega; *C. valida*, *C. chrysogastra*, *C. aeneiventris*, *ibid.*, note, *C. punctiventris*, *C. nymphula*, *C. rugulicollis*, *C. linearis*, *C. nigrina*, p. 417, note, S. Brazil; *C. ignicollis*, *ibid.*, Cayenne.
- Ancylocera seticornis*, p. 418, Santarem.
- Callopiisma ruficollis*, p. 419, Pará.
- Tropidosoma penniferum*, p. 423, Ega (? = *Ctenodes isabellina*, Bates, ♀).
- Ctenodes isabellina*, p. 424, Ega.
- Sternacanthus 6-maculatus*, Tapajos, and *S. allstoni*, Montes Aureos, Pará, p. 426.
- Ceragenia spinipennis*, p. 427, Ega.
- Pteroplatus simulans*, p. 428, Ega.
- Eriphus xanthoderus*, p. 429, Pará.
- Trachyderes rhodopus*, p. 431, and *T. impunctipennis* (? = *lacordairei*, Dup. var.), p. 432, Santarem; *T. melas*, *ibid.*, Obydos; *T. politus*, *ibid.*, note, Venezuela; *T. globicollis*, p. 433, Ega.
- Lissonotus fallax*, p. 436, Ega; *L. ephippiatus*, p. 437, Ega and S. Paulo; *L. simplex*, p. 438, Villa Nova; *L. princeps*, *ibid.*, note, Bolivia.
- Megaderus latifusciatus*, p. 438, note, Chontales, Nicaragua.

Distenia agroides, p. 439, Tapajos; *D. splendens* and *D. denticornis*, *ibid.*, and *D. suturalis*, p. 440, Ega; *D. rufipes*, Sta. Marta, New Granada, and *D. angustata*, int. Cayenne, *ibid.* note.

Cometes latificus and *C. scapularis*, p. 441, and *C. cæruleus*, p. 442, Ega.

TASCHENBERG (Z. ges. Naturw. 1870, Bd. i. p. 194) describes, under the name of *Callichroma iris*, an insect from Columbia, apparently without certainty as to its being described before.

ABEILLE DE PERRIN (Ann. Soc. Ent. Fr. 4^e sér. x. p. 85) describes at full length his *Callidium* (*Semanotus*?) *spinicorne*, of which diagnosis published in Pet. Nouv., 1 Dec. 1869. [The object of snatching priority by thus bisecting a proper description has apparently been gained in this instance, as Perrin states his insect to be identical with *varini*, Bedel, published in January or March, 1870, in 'L'Abeille.' He, however, erroneously dates his diagnosis in November 1869.]

KRAATZ (B. E. Z. xiv. pp. 405-410, Taf. iii. f. 2-4 a, b, to appear in vol. xv.) describes, and in some cases figures, varieties of certain European spp. of *Clytus*. According to him *C. apicalis*, Hampe, cannot be considered specifically distinct from *C. arcuatus*. Of *C. floralis*, Pall., he names *abruptus* (Parreyss in lit.) a Crimean var., and *pruinosis* a var. from Sarepta—noting also the difference between the vars. *zebra* of Dalman (nec Schönh., as in Stein's Cat.) and Laporte. He also names *viridicollis* a Grecian var. of *C. verbasci* (L.).

Platymotus (Muls. nec Dej.) is changed to *Hadroclytus* by Kraatz, C. H. iv. p. 32.

ABEILLE DE PERRIN (Nouv. et faits div., No. 15) gives differential characters for *Criocephalus rusticus* and *ferus*, objects to *Clytus scalaris* being considered conspecific with *C. speciosus* and *siculus*, considers *C. fulvicollis* a hybrid between *massiliensis* and *ruficornis*, refers to a curious race (?) of *C. mysticus* from Prussia, and adds *Dolocerus reichei* to the French lists.

Xylosteus spinolæ, Friv. Kraatz, B. E. Z. xiv. pp. 413-415, notes the great sexual differences of this rare species, to which he refers *Rhagium maculatum*, Sturm (Cat. Käfersamml. 1843), from Illyria. He suspects the existence of a second sp. of the genus, which he provisionally names *illyricus*.

v. HEYDEN (B. E. Z. xiv. Beih. p. 163) redescribes *Strangalia approximans*, Rosenh., the ♀ of which = ♂ of *Leptura distigma*, Charp. Mulsant appears to have first indicated Charpentier's error.

Leptura longiceps, Kby., = *Acmeops strigillata* (F.); *A. marginalis*, Lec., = *longicornis* (Kby., *Lep.*): Lec., Ann. N. H. ser. 4, vi. p. 399. *Typocerus cervinus*, Walk., = *Toxotus spurcus*, Lec.; *Tox. perductor*, Walk., = *Lept. (Stenura) obliterata* (Hald.), var.: Lec. *ibid.* p. 402.

Abeille de Perrin (Nouv. et faits div., No. 16) points out the differences between certain spp. of *Pachyta* allied to *8-maculata*.

Varieties of *Pachyta interrogationis* (L.) and *P. variabilis*, Gebl., are discussed at some length by Solsky, Hor. Ent. Ross. vii. p. 394 et seq.

Grammoptera dentatofasciata, Mots., = *Pachyta 6-maculata* (L.), var.: Solsky, l. c. p. 403.

New genera :—

Litomeces, Murray, Ann. N. H. ser. 4, v. p. 53. Differs from *Promeces* in its antennæ being slender and not thickened towards the apex, its very

elongate head and thorax, and its post. femora being longer than apex of its parallel elytra. Sp. *L. splendidus* (Chevr., *Promeces*).

Phrosyne, Murray, l. c. p. 162. Differs from *Euporus* in its antennæ being shorter than the body and thickened at apex (joint 3 = 4-6), and its post. femora not reaching the apex of elytra. Sp. *P. viridis* (Serv., *Eup.*), and *P. brevicornis* (F., *Eup.*), with the latter of which the author thinks *E. disparilis*, Chev., may be synonymous.

Trachelophanes, Murray, l. c. p. 170. Distinguished from *Hesperophanes*, Muls., by its cylindrical neck. Sp. *T. puberulus* (Chevr., *Hesper.* P.).

Aphoplistus, Murray, l. c. p. 173. Superficially resembles *Asemum*, but to be placed between *Hesperophanes* and *Sphæron*. Sp. *A. pilosella* (Chevr., *Bmona*).

New species:—

Cordylomera gratiosa, Murray, l. c. p. 54, O. Calabar.

Xystrocera marginipennis and *X. pascoei*, Murray, l. c. p. 165, O. Calabar.

Callidium lineare, Hampe, B. E. Z. xiv. p. 335, Corfu; *C. (Rhopalopus) varini*, Bedel, L'Ab. vii. p. 94, Paris and S. France. (Cf. Bellier de la Chavignerie, Nouv. et faits div. p. xxxiii.)

Semanotus chlorizans, Solsky, Hor. Ent. Ross. vii. p. 384, E. Siberia.

Clytus sternii, Ktz. l. c. t. iii. f. 1, Waldholz.

Pachyta balcanica, Hampe, B. E. Z. xiv. p. 336, Balkans.

Strangalia adustipennis, Solsky, l. c. p. 404, E. Siberia.

Leptura globicollis, Desbr. des Loges, l. c. p. 127, Turkey.

Grammoptera bicarinata, Arnold, Hor. Ent. Ross. vi. pp. 137 and 138, tab. iii. fig. 7, a, b, Mohilewia, and other Russian localities (? = *livida*, F.; cf. Bull. des séances, *ibid.* vii. p. iv).

Abeille de Perrin (Ann. Soc. Ent. Fr. x. pp. 88-90) curtly describes, under the name *Cortodera (Grammoptera) monticola*, an insect captured by himself in the Alps, and hitherto considered to be *holosericea* (F.), under which name he points out the confusion of two distinct spp. [The author claims 1869 as the date of this description: why, the Recorder cannot tell.]

Lamiades.

Dorcadion alternatum, Chev., = *graellsii*, Graells, var., of which another (♀) var. is described and named *ovale*; *D. encaustum*, Chev., = *hispanicum*, Muls., var.; a ♀ var. of *D. perezi*, Graells, is described and named *anthracinum*; *D. ariasi* and *D. reichii*, Chev., are probably conspecific: Chevrolat, Ann. Soc. Ent. Fr. 4^e sér. x. Bull. pp. lxxxv and lxxxvi.

Dorcadion molitor, Chev., is not identical with [*D. lineola* (Ill.)], though *D. molitor*, Kies., may possibly be so: Kraatz, B. E. Z. xiv. Beih. p. 163, note.

DESBR. DES LOGES (L'Ab. vii.) redescribes his *Dorcadion sutura-alba*, p. 125, and *Phytæcia algerica*, p. 126.

Abeille de Perrin (Ann. Soc. Ent. Fr. 4^e sér. x. p. 87) describes at full length his *Monohammus nitidior*, of which diagnosis published in Pet. Nouv. 1 Dec. 1869. He considers there is some doubt as to the true *M. sutor*, and gives (p. 88) a table of differences of four allied species.

Monohammus cinerascens, Mots., = *heinrothii* (Cederj.); *M. impluviatus*, Mots., = *saltuarius* (Esch.): Solsky, Hor. Ent. Ross. vii. p. 389.

Ancey records *Niphona picticornis*, Muls., from the ends of dead fig-tree branches at Martigues (Nouv. et faits div. p. xlv).

Oncideres cingulatus (Say), known in N. America as the "Twig-girdler" is figured, and its habits are noted, in Amer. Ent. i. p. 76.

ROUGET (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xlviii) describes the economy of *Agapanthia angusticollis* (Gyll.), which at Dijon frequents *Heracleum sphondylium*, and is also recorded from *Carduus nutans* and *Senecio aquaticus*.

JACOBINI (in 'Corrispondenza scientifica,' Rome) describes the economy of *Saperda tenuis* [? *Hippopsis gracilis*, Cr.]. Cf. Bull. Ent. Ital. ii. p. 288.

Oberca ragusana, Küst., is not Dejean's sp. of that name, but is probably *Phytæcia ephippium* (F.); *O. insidiosa*, Muls., is not specifically identical with Küster's insect, as De Marseul has considered it. *Phytæcia fuscicornis*, Muls., Oct. 1863, nec v. Heyden, June 1863, is renamed *orientalis*. Kraatz, B. E. Z. xiv. p. 272.

ABEILLE DE PERRIN (Nouv. et faits div., No. 16) points out the frequent existence of a spine on the posterior femora of certain spp. of *Phytæcia*, and gives a list of some French red-legged spp., especially referring to this character.

Velleda murinum, Thoms., = *callizona*, Chev.; *Acmocera subundata*, Chev., = *compressa* (F.); *Batocera albertiana*, Thoms., = *wyliei*, Chev.: Murray, Ann. N. H. ser. 4, v. p. 408 et seq.

Phrystola, g. n., Murray, l. c. p. 412. Partakes of the characters of *Phrynetæ* and *Pachystola*. Sp. *P. cæca* (Chev., *Phrynetæ*).

Eumecocera, g. n., Solsky, Hor. Ent. Ross. vii. p. 391. Legs elongate and slender; antennæ setiform, delicate and long. Sp. *E. (Saperda) impustulata* (Mots.).

New species:—

Dorcadion heydenii, Ktz. l. c. p. 161, Albas; *D. formosum*, Ktz., B. E. Z. xiv. p. 411, T. iii. f. 5, Caucasus; *D. obesum* (?), G. des Cottes, Mitth. schw. ent. Ges. iii. p. 263, Toulouse; *D. brannani*, Schauf., Nunq. Otios. p. 64, Serra Estrella, Portugal; *D. stableau*, Pyrenees, and *D. drusum*, Syria, Chevrolat, Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. lxxxiv.

Tragocephala anelli, H. W. Bates, Tr. E. Soc. 1870, p. 530, Kinsembo, S. W. Afr. (? = *buquetii*, Thoms., var.).

Tæniotes trivittatus, Taschenberg, Z. ges. Naturw. 1870, Bd. i. p. 194, Ecuador; *T. univittatus*, Tasch. l. c. p. 195, Venezuela.

Phrynetæ luctuosa, Murray, l. c. p. 411, O. Calabar.

Pachystola ligata, Murray, l. c. p. 481, O. Calabar.

Agapanthia insularis (Reiche), G. des Cottes, l. c., Ajaccio (= *corsica*, des C., cf. Zool. Rec. vi. p. 295).

Phytæcia rufiventris, G. des Cottes (diagnosis only), Pet. Nouv., 15 July 1870, p. 104, S. Russia.

PHYTOPHAGA.

Donaciades.

Rye records Kraatz's present opinion that *Donacia comari*, Suffr., is a good species, on the authority of Kraatz himself (Ent. M. M. vii. p. 59).

The occurrence of the southern *Donacia reticulata*, Gyll., near Brussels is recorded in Ann. E. Belg. xiii. c.-r. p. v.

For a description of the larva and detailed account of the habits of *Hæmonia*, with list of water-plants frequented by its species, cf. Leprieur, in Bull. Soc. Colm. 1870, and Bellevoye, Bull. Soc. Moselle, 1870, x. The former author mentions great differences in individuals of species hitherto considered without doubt to be firmly established; and evidently inclines to the belief that all the described spp. should be reduced to one. Deyrolle (Pet. Nouv. 21, p. 84) gives some particulars as to the habits of *H. mosella*.

Hæmonia rugipennis, sp. n., J. Sahlberg, Öfv. Fin. Soc. xii. p. 65, and *H. incisa*, sp. n., J. Sahlb. l. c. p. 67, Finland.

Criocerides.

The principal stages of *Lema 3-lineata* (Ol.) are figured, and details of the economy of the sp. given in Amer. Ent. i. p. 26, figs. 16 & 17.

Megascelis postica, Clark, 1865, nec Lac. 1845, is renamed *parallela*, v. Harold, C. H. vi. p. 119.

Rhæbus beckeri, Suffr., *sagroides*, Solsky, = *mannerheimii*, Mots.: Solsky (Bull. Mosc. xlii. p. 466), who doubts Motschoulsky's assertion that the individuals with large femora are females.

Lema gallæciana, sp. n., v. Heyden, B. E. Z. xiv. Beih. p. 164, Santiago di Compostella.

Megascelis tæniata, sp. n., Kirsch, B. E. Z. xiv. p. 675, Bogotá.

Clythrines.

Labidostomis. Lefèvre (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xlii) remarks upon certain species allied to *L. bigemina*, Suffr., which latter he records from Sardinia only. Kraatz (Hor. Ent. Ross. viii. p. 31) names *sareptana* a var. of *L. lucida*, Germ.

WOLLASTON (Ann. N. H. ser. 4, v. p. 27, note) points out the confusion as to localities cited by Fabricius for his *Clythra* (*Cryptoceph.*) *ruficollis*, and inclines to the belief that there are two spp. under that name, one from S. Europe, the other from St. Helena, the former of which would, in that case, require renaming, as the original description distinctly applies to the latter. [The original Banksian type is a *Galeruca*.]

Clythra bisignata, Walk., = *Saxinis saucia*, Lec.: Lec., Ann. N. H. ser. 4, vi. p. 402.

Omorphus concolor (Stm.). Reitter (B. E. Z. xiv. p. 230, T. i. f. 8 a-h) recapitulates and figures the generic characters of this sp., which he refers to the *Chrysomelides*.

Labidostomis maculipennis, sp. n., Lefèvre, l. c., Turkey, Persia, &c.; *L. senicula*, sp. n., Ktz., Hor. Ent. Ross. viii. p. 29, Derbent and Astracan.

Calyptorhina andalusica, sp. n., v. Heyden, B. E. Z. xiv. Beih. p. 165, Ronda.

Clythra. Desbr. des Loges (L'Ab. vii.) describes the following new spp.: — *C. (Titubæa) algerica* and *C. (T.) 13-punctata*, p. 128, Algeria; *C. dissimilithorax*, p. 129, Asia Minor; *C. (Chilotoma) raffrayi*, p. 130, Corsica.

Eumolpides.

Pachnephorus robustus, sp. n., Desbr. des Loges, L'Ab. vii. p. 132, Sarepta.

Cryptocephalides.

Cryptocephalus hypochaeridis (Thoms., Sk. Col. viii.) = *sericeus* (L.): Thoms. l. c. x. p. 275; *C. sericeus* (Thoms. nec L.) is renamed *bidens*: *ibid.* p. 274.

Pachybrachys haliciensis, Mill., is recorded by Pelikan from the Wien, near Hietzing (Verh. zool.-bot. Ges. Wien, xx. p. 55).

Cryptocephalus asturiensis, sp. n., v. Heyden, B. E. Z. xiv. Beih. p. 166; *C. pæciloceras*, sp. n., v. Heyd. l. c. p. 167, Santas Albas; *C. bicallosus*, sp. n., Kirsch, B. E. Z. xiv. p. 375, Bogotá.

Stylosomus bituberculatus, sp. n., Desbr. des Loges, B. E. Z. xiv. Beih. p. 169, Andalusia.

Chrysomelides.

Vogel (Nunq. Otios. pp. 65-80) makes some general observations upon the *Chrysomelides* of Middle and South Africa, of which he gives (pp. 69-77) a tabular arrangement, containing indications of 54 new spp. The author characterizes *Horatopyga* (Stål), and describes 5 spp. (3 new).

Dohrn (S. E. Z. xxxii. p. 357) quotes Hope's reference of *Chrysomela sparshalli*, Curt., to *variolosa*, Petagna.

Rupertsberger (Verh. z.-b. Ges. Wien, xx. pp. 840-842) describes the larva and pupa, and records his observations on the economy of *Chrysomela varians*, F., from *Hypericum perforatum*.

The eggs of *Chrysomela fastuosa*, L., are attacked by one of the *Pteromalides*: Wagner (in Trav. prem. assembl. Nat. de Russ.).

Lucas (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. 1v) notes *Chrysomela banksii*, var., from Brittany.

Lina tremula (F.) and *longicollis* (Suffr.). Kirsch, B. E. Z. xiv. p. 218, recapitulates the differential characters of these species.

Somerville (Ent. M. M. vii. p. 108) notes the earlier stages of *Melasoma ænea*.

The habits of *Doryphora 10-lineata*, Say, and *D. juncta*, Germ., respectively known in N. America as the true and "bogus" Potato-bug, are described, and figures of all their stages given, in Amer. Ent. i. p. 41 *et seq.* figs. 33 & 34.

Perris (L'Ab. vii. p. 35) always finds the larvæ of *Prasocuris beccabunga* on the leaves of *Sium latifolium*, and not in the stems of that plant, which Boié states to be the habitat of *P. phellandrii*. The larva never occurs on the *Veronica* from which the species takes its name, according to Perris.

Bellevoüe (Nouv. et faits div. p. xxi) supplies notes on the economy of *P. phellandrii*, the larva of which lives, according to him, in stems of *Ænanthe phellandrium*.

New species:—

Timarcha bruleriei (Fairm. MS.), Bell. de la Chavign., Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xxvii, Dourbes. (Cf. Abeille de Perrin, *ibid.* p. xlvii.)

Chrysomela cantabrica, v. Heyden, B. E. Z. xiv. Beih. p. 170; *C. rufofemorata*, v. Heyd. l. c. 171, Santas Albas.

Elytrophæra sculptilis, Kirsch, B. E. Z. xiv. p. 376, Bogotá.

Goniocetena grandini, Desbr. des Loges, L'Ab. vii. p. 132, Amélie-des-Bains.

Horatopyga mniszeechii, Vogel, l. c., C. of Good Hope and Namaqua; *H.*

schaufussii, Vog. l. c. p. 79, Natal, Caffraria, C. of Good Hope; *H. stålhi*, Vog. l. c. p. 80, Caffraria.

Pyxis bogotensis, Kirsch, B. E. Z. xiv. p. 377, Bogotá.

Gallerucides.

DESBR. DES LOGES (L'Ab. vii. p. 134) redescribes his *Galleruca carinulata*.

RONDANI (Nota &c.) refers to, and in two instances describes, parasites of the orders *Diptera* and *Hymenoptera* upon *Galleruca xanthomelæna* (*calmariensis*).

ROMANES (Ent. 78, p. 98) notes the occurrence of vast numbers of a sp. of *Galleruca* on the surface of the sea on the coasts of Moray and Cromarty, in May 1870.

The "Cucumber-beetle" (*Diabrotica vittata*, F.) is recorded by Zeller as attacking blossoms of pear and cherry in Illinois, U. S. A. Amer. Ent. & Bot. ii. p. 239.

Galleruca T-nigrum, sp. n., G. Bertoloni, Mem. Ac. Bologn. 2nd ser. viii. p. 192, tab. i. f. 1, nos. 1 & 2, Mozambique.

Aulacophora petersi, sp. n., G. Bertol. l. c. p. 194, t. i. figs. 3 & 4, Mozambique.

Dianthia bimaculata*, sp. n., G. Bertol. l. c. p. 195, t. i. figs. 5, 6, 7, Mozambique.

Luperus biraghii, sp. n., Ragusa, Bull. Ent. Ital. ii. p. 314, Palermo; *L. diniensis*, sp. n., Bell. de la Chavign., Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xxvii, Digne (most probably=*betulinus*, var.: Abeille de Perrin, *ibid.* p. xlvii).

Halticides.

LETZNER (JB. Schles. Ges. xlvii. pp. 182-184) gives a list of *Halticidae* recently detected in Silesia, occasionally noting the food-plants of the spp.

Haltica cucumeris, Harr., is figured, and an account of its injuries to the potato given in Amer. Ent. i. p. 27, f. 19.

Haltica chalybea, Ill., is figured in its chief stages, and an account of its ravages to the grape-vine given, by Riley in Amer. Ent. & Bot. ii. pp. 327 & 328, figs. 204 & 205.

Psylliodes attenuatus (Ent. H.) is known as "the Hop-flea" in Kent: Gorham (Ent. M. M. vii. p. 36).

PERRIS (L'Ab. vii. p. 94) notes the larva of *Dibolia paludina*, from Mont de Marsan, as establishing its galleries in the leaves of *Mentha rotundifolia*.

Orestia pommereauvi, sp. n., Perris, l. c. p. 83, Tenès.

Aphthona heydeni, sp. n., Allard, B. E. Z. xiv. Beih. p. 172, Ronda; *A. brunnipes*, sp. n., All. (diagnosis only) Pet. Nouv., 1 Jan. 1870, p. 50, Seville.

Cassidides.

BURMEISTER (S. E. Z. xxxi. pp. 273-281) describes the species of *Cassidides* occurring in the R. Plate district, and makes numerous observations, chiefly as to localities, on certain spp. attributed to the same district by Boheman.

* As to this generic name, cf. Zool. Rec. vi. p. 298. There is also a *Dianthia* (Solier) in the *Elateridae*.

V. FRAUENFELD (Verh. zool.-bot. Ges. Wien, **xx**, p. 44) communicates observations made by Aug. Wimmer on *Cassida oblonga*, which, according to the latter, is injurious to sweet turnips. Some little doubt is indicated as to the correctness of this statement.

Cassida prasina, Gyll., = *viridula*, Payk.: Thomson, Sk. Col. **x**, p. 278.

BURMEISTER, *l. c.*, describes the following new species:—

Mesomphalia inaurata, p. 275, Tucuman.

Pecilaspis tessellata, p. 276, Tucuman.

Chelymorpha polyspilota, p. 278, and *C. piperata*, p. 279, Monte Video.

Physonota unicolor, p. 280, Mendoza.

Coptocycla graminis, p. 281, Tucuman, Buenos Ayres.

EROTYLIDÆ.

CROTCH (Ent. 73, pp. 7 & 8) gives brief characters (compiled from Bedel's monograph) for the British spp. (real and reputed) of *Triplax*. He also in like manner discusses the British spp. of *Engis*.

Erotylus ziczac, sp. n., Taschenberg, Z. ges. Naturw. 1870, Bd. i. p. 196, Columbia.

Mycotretus. Taschenberg, *ibid.*, describes the following new species from Columbia:—*M. dispar* and *multimaculatus*, p. 197; *bicolor*, *dimidiatus*, and *coccinelloides*, p. 198; *discoidalis*, p. 199.

ENDOMYCHIDÆ.

A Tyrolean var. of *Mycetina cruciata* (Schall.) is described, and named *interrupta*, by Gredler, C. H. vi. p. 17.

COCCINELLIDÆ.

SOUTHWELL (Tr. Norw. Soc. 1869-70) remarks upon the abundance of *Coccinellæ* on the Norfolk coast.

SOMERVILLE (Ent. M. M. vii. p. 108) notes the earlier stages of *Coccinella* 16-guttata.

Chilocorus bivulnerus, Muls., and its larva, antagonistic to a bark-louse (*Aspidiotus harrissii*, Walsh) in Iowa, are described and figured in Amer. Ent. i. p. 39, f. 32. *Hippodamia maculata* (De G.), *H. 13-punctata* (L.), *H. convergens* (Guér.), and *Coccinella 9-notata*, Hbst., which prey upon the eggs of *Doryphora 10-lineata*, Say, are also described and figured, *l. c.* p. 46.

New species:—

Coccinella ghilianii (Fairm. MS.), Bell. de la Chavign., Ann. Soc. Ent. Fr. 4^e sér. **x**, Bull. p. xxvii, Digne, Piedmont (this is almost certainly *Harmonia lyncea*, Ol.: Abeille de Perrin, *ibid.* p. xlvii).

Calvia eburnea, B. de la Chavign. *l. c.* p. xxviii, Digne (cf. Abeille de Perrin, *l. c.*).

Pharus basalis, Kirsch, B. E. Z. xiv. p. 394, Egypt.

Scymnus includens and *S. isidis*, Kirsch, *ibid.* p. 395, and *S. varius*, p. 396, Egypt; *S. conjunctus*, Wollaston, Ann. N. H. ser. 4, v. p. 248, S. Vincente (Cape-Verdes).

HYMENOPTERA

By E. C. RYE.

LIST OF PUBLICATIONS.

BALLION, E. Ueber *Tenthredo flavicornis* und *T. luteicornis*.
Bull. Mosc. xlii. pp. 441-448.

Contains elucidation of synonymy, and a list of omissions (chiefly spp. described by Eversmann in Bull. Mosc. 1847) from Kirchner's Cat. Hymenopt. Europæ.

BASSETT, H. F. Galls found on plants of the genus *Rubus*.
Canad. Ent. ii. pp. 98-100.

Contains descriptions of two new species of *Diastrophus*, from N. America.

BENDEL, H. Die Pflege der Biene bei den Römern. Ber. St. Gall. Ges. 1869, p. 137 *et seq.*

An interesting compilation of scattered accounts by different authors.

BÜTSCHLI, O. Zur Entwicklungsgeschichte der Biene. Z. wiss. Zool. xx. pp. 519-564, Taf. xxiv.-xxvii.

The author enters very minutely into the development of the various internal and external organs of the larva of *Apis mellifica*, from the earliest obtainable embryo. The different stages, with much highly magnified detail, are illustrated by four very clear and copiously annotated plates.

CHEVRIER, FRÉDÉRIC. Description de quelques Hyménoptères du Bassin du Léman. Mitth. schw. ent. Ges. iii. pp. 265-276.

Seven new species are described in this paper.

COSTA, ACHILLE. Prospetto sistematico degli imenotteri italiani, da servire di Prodomo della Imenotterologia Italiana. Ann. Mus. Nap. v. 1865 (pub. in 1869), pp. 60-116.

In continuation of his proposed Prodomus (the 1st part of which, published in 1867, contained an analytical table of the aculeate *Hymenoptera*, and of the subfamilies of the *Crabronide*, treating the *Sphégides*, *Larrides*, and *Bembecides* in detail, as regards the Italian species), the author describes the Italian species of the *Nyssonides*, *Philanthides*, and *Mellinides*, of which 15 are treated as new.

COUPER, WILLIAM. Remarks on the history and architecture of the Wood paper-making Wasps. Canad. Ent. ii. pp. 49-53.

Treats of the economy of the American *Vespa maculata* and *V. germanica*.

COUPER, WILLIAM. On the economy of a species of *Feonus* [*sic*].

Canad. Ent. ii. p. 110.

One new species is described.

EMERY, CARLO. Descrizione di una nuova *Formica* italiana. Ann.

Mus. Nap. v. pp. 117 & 118.

Contains description of a new genus and species (recharacterized in the author's paper next quoted).

——. Studi Mirmecologici. Bull. Ent. Ital. ii. pp. 193–201, tav. 2. f. 1, 2, 3, 6, 7.

Contains extended notices of and fresh localities for recorded species of *Formicidae*, characters for one new genus, descriptions of five new species, and fig. of one new species, with details of it and of another species.

FOREL, AUGUSTE. Notices myrmécologiques. Mitth. schw. ent. Ges. iii. pp. 306–312.

Contains observations on *Polyergus rufescens*, proving that insect to have no sting; and description of the ♂ of *Cremastogaster sordidula* (Nyl.), not before known, and which appears to present abnormal intermediate forms.

FREYMUTH (M^{re}). *Pompholyx dimorpha*, n. sp., nouvelle forme aptère de la famille des Tenthredinides, et quelques autres espèces nouvelles de cette famille. Protoc. de la 47^{me} séance d. l. Soc. Imp. des amateurs des sc. nat. d'antrop. et d'etnogr. à Moscou, 29 Jan. 1870, pp. 213–225.

A new genus and seven species are characterized. The diagnostic characters are in Latin; and at the end of the article are two synoptical tables for the determination of the European and Asiatic species of *Tarpa*.

GIRAUD, JOSEPH. Note sur le *Janus femoratus*, Curtis, Hyménoptère de la famille des Tenthredines. Ann. Soc. Ent. Fr. (4) x. pp. 27–30.

A short account of four species of *Janus* and *Cephus*, with a list of the authors who have written on their economy.

HENSEL, A. *Prosopis gerstaeckeri*, eine muthmasslich neue Bienen Art. B. E. Z. xiv. pp. 185–190.

HOLMGREN, AUGUST EMIL. Kongliga Svenska Fregatten *Eugenies* Resa omkring Jorden. Vetenskapliga Iakttagelser, ii. Zoologi; 1. Insecta (Häft. 12. *Hymenoptera*, pp. 391–442, Tafl. viii.). Stockholm, 1868.

The author, in this part of the 'Entomologiska Bidrag' of the well known '*Eugenies* Resa,' characterizes six new genera and describes 101 new species, from all divisions of the globe except Europe, and the majority of which are *Ichneumonidae*. The plate is above praise, as a lithograph.

KRAATZ, GUSTAV. v. Siebold's Beobachtungen über Parthenogenesis bei *Polistes gallica* sowie über Pädogenesis der Strepsipteren. B. E. Z. xiv. pp. 47, 48.

Kraatz briefly recapitulates v. Siebold's observations, resulting in the distinct proof that male individuals of *Polistes* proceed through parthenogenesis from non-fecundated ova.

KRIECHBAUMER, JOSEPH. Vier neue Hummel-Arten. Verh. z.-b. Ges. Wien, 1870, Bd. xx. pp. 157-160.

Contains descriptions of three new species of *Bombus*, and of one *Psithyrus*, all from South Europe.

MÄKLIN, FRIEDRICH WILHELM. Om parthenogenesis eller jungfrulig fortplantning hos *Polistes gallica*, L. Öfv. Fin. Soc. xii. pp. 112-118.

Discusses v. Siebold's paper on the same subject [*cf.* also Breyer, Ann. E. Belg. xiii. c.-r. p. xii].

MARSHALL, T. A. Ichneumonidum Britannicorum Catalogus. London: 1870, pp. 22.

This carefully prepared list corrects many errors in Desvignes's Brit. Mus. Cat., and adds several genera and about 280 species to the British list.

MAYR, GUSTAV L. Die mitteleuropäischen Eichengallen in Wort und Bild. (Erste Hälfte.) Wien: 1870, 8vo, pp. 34, 4 pls.

An introductory account of galls affecting the oak—upwards of 40, peculiar to different parts of that tree, being described and figured. One new species is described.

—. Neue Formiciden. Verh. z.-b. Ges. Wien, 1870, xx. pp. 939-996.

The author characterizes 2 new genera and 55 new species (from all parts of the world).

MENZEL, AUGUST. Die Biene in ihren Beziehungen zur Kulturgeschichte und ihr Leben im Kreislauf des Jahres. Zurich: 1869, pp. 78, 1 pl.

[The Recorder has not seen this work.]

MORAWITZ, FERDINAND. Beitrag zur Bienenfauna Russlands. Horæ Ent. Ross. vii. pp. 283-333.

Contains Russian localities for and (mostly) descriptions of 50 species of *Anthophila*, of which 15 are treated as new. One new species (*Osmia*), from S. France, is described in a note.

NORTON, EDWARD. Description of Mexican Ants noticed in the American Naturalist, April 1868. Comm. Ess. Inst. vi. pp. 1-10. [The internal sheet-mark of this paper is July

1868; but vol. vi. part 1, in which it is published, is dated "1868" in the middle, and "March 1870" at the bottom, of the outside wrapper.]

Contains descriptions of 17 species, of which 13 are treated as new. Some outline figures are given.

PULS, J. Note sur les Hyménoptères rapportés des provinces occidentales de la Transcaucasie par M. Théophile Deyrolle. Ann. E. Belg. xiii. pp. 147-152.

A catalogue of the *Tenthredinidæ* taken by Deyrolle in the Caucasus, with descriptions of four new species.

RADOSZKOVSKY, OCTAVIUS. [See SICHEL.]

RONDANI, CAMILLO. Sopra tre specie di imenopteri utili all' Agricoltura. Arch. p. Zool. (2) ii. pp. 10-16, pl. i. figs. 1-11.

Two new species of *Chalcididæ* are described.

SAUSSURE, HENRI F. DE. Vespidae Americanæ novæ nonnullæ. R. Z. 1870, pp. 55-62, 103-106, 140-142.

SCHENCK, CARL FRIEDRICH. Beschreibung der Nassauischen Bienen. JB. Ver. Nass. xxi. & xxii. pp. 269-382.

This is a second supplement to the author's work on the same subject in JB. Ver. Nass. xiv. (the first supplement being published in Heft xvi.), and consists of additions and corrections. One new genus and about 30 new species are characterized; but the author's method of indicating novelties is so obscure, that it is almost impossible to be sure as to the number of the latter. Many synonymical observations are made, some being original; and synoptical and sectional tables are given. 269 species of *Anthophila*, belonging to 37 genera, are recorded from Nassau; and the German species are stated to be 376 in number, comprised in 47 genera.

——. Bemerkungen zu einigen der im Jahrg. 30 der Entom. Zeitung beschriebenen Bienen. S. E. Z. xxxi. pp. 104-107.

——. Ueber einige schwierige Arten *Andrena*. Ibid. pp. 407-414.

SCHLECHTENDAL, D. H. R. von. Beobachtungen über Gallwespen. Ibid. pp. 338-317, 376-398.

Contains descriptions of five new species, and names for (but descriptions of the galls only of) six other new species.

SICHEL, JULES, & RADOSZKOVSKY, OCTAVIUS. Essai d'une Monographie des Mutilles de l'Ancien Continent. Horæ Ent. Ross. vi. pp. 139-309, tab. vi.-xi. [pp. 139-172, containing descriptions of eight species, are included in Zool. Rec. vi.].

The authors describe 146 species, of which 35 are treated as new, although suspicion is sometimes excited as to their differences being merely sexual. They give coloured figures of 47 species, with outline detail, and make some changes in nomenclature. A supplement (pp. 304-309) is added, wherein 10 exotic species are referred to, one being described as new.

SIEBOLD, CARL THEODOR ERNST VON. Ueber Parthenogenesis bei *Polistes gallica*. Z. wiss. Zool. xx. pp. 236-242.

The result of v. Siebold's observation is a conviction that the males in this species are produced by parthenogenesis from unfertilized eggs.

[Cf. Mäklin, Öfv. Fin. Soc. xii. pp. 112-118; Kraatz, B. E. Z. xiv. pp. 47, 48; Breyer, Ann. E. Belg. xiii. c.-r. p. xii.]

SMITH, FREDERICK. Notes on various species of Apidæ, Formicidæ, Fossores, and Vespidæ; with observations on some of the parasites of the latter. Ent. Ann. 1871, pp. 55-70.

Relates to the recorded British species.

SNELLEN VAN VOLLENHOVEN, SAMUEL CONSTANTINUS. Schetsen ten Gebruike bij de Studie der Hymenoptera (uitgegeven door de Nederl. Ent. Ver.). Gravenhage: Obl. fol.

The first two parts treat of the *Ichneumonides* and *Braconides*, of which outline figures are given.

——. De inlandsche Bladwespen in hare gedaantewisseling en levenswijze beschreven. Tijdschr. Ent. (2) v. pp. 55-74, pls. 1-4.

The author continues his account of the Netherland *Tenthredinidæ*. One new species is described.

STEIN, J. P. E. FR. Ueber *Eurypterna* (Foerst.) *cremieri*, Brébisson. B. E. Z. xiv. p. 426, T. iii. f. 8a-c.

TASCHENBERG, E. L. Ueber einen Zwitter von *Amblyteles hermaphroditus*, einer neuen *Ichneumon*-Art. B. E. Z. xiv. pp. 425 & 426.

——. Die Larridæ und Bembecidæ des zoologischen Museums der hiesigen Universität. Z. ges. Naturw. 1870, ii. pp. 1-27.

Twenty-five new species are described in this paper.

——. Die Arten der Gattung *Ichneumon*, Gr., mit linealen oder lineal-elliptischen Luftlöchern des Hinterrückens. Ibid. pp. 209-272, 369-416, 449-470.

THOMSON, C. G. Forsök till gruppering af Sveriges Apiarier. Opusc. Ent. i. pp. 3-25.

A conspectus of the genera of the Swedish *Anthophila*, 27 in number, with outline woodcuts of neurulation on p. 6.

THOMSON, C. G. Genus *Cœlioxyx*. Opusc. Ent. i. 3, pp. 41–43.
Six Swedish species are described.

——. Öfversigt af Sveriges *Vespariæ*. *L. c.* i. 5, pp. 78–90.

A conspectus of the Swedish genera (6) and species (36), 8 being described as new.

——. Öfversigt af de i Sverige funna arter af *Epeolus*, *Nomada*, och *Sphæcodes*. *L. c.* ii. 6, pp. 90–100.

Descriptions of the Swedish species of those genera. Twelve appear to be new.

——. Öfversigt af de i Sverige funna arter af Släktet *Chrysis*, *L.* *L. c.* ii. 7, pp. 101–108.

A conspectus of the Swedish genera (6) and species (28), two being new.

——. Öfversigt af de i Sverige funna arter af Genus *Andrena*. *L. c.* ii. 10, pp. 140–156.

Thirty-nine Swedish species are described, five as new.

——. Öfversigt af Sveriges *Crabroner*. *L. c.* ii. 11, pp. 156–180.

The Swedish genera (5) and species (46) are described, four being new.

——. Öfversigt af Sveriges *Rofsteklar*. *L. c.* ii. 13, pp. 202–251.

The 17 families of *Fossiores* occurring in Sweden are tabulated, and the genera and species described.

——. Öfversigt af Sveriges *Humlör*. *L. c.* ii. 14, pp. 251–261.

The genera *Bombus* and *Apathus* are described, with 26 Swedish species.

——. Öfversigt af Sveriges *Tenthrediner*. *L. c.* ii. 15, pp. 261–304.

The Swedish species are distributed into 21 genera and 122 species (10 new).

——. Öfversigt af de i Sverige funna arter af *Hylæus*, *Halictus*, *Colletes*, och *Rhophites*. *L. c.* iii. 16, pp. 305–316.

Thirty-five Swedish species are described.

TSCHÉK, C. Beiträge zur Kenntniss der österreichischen Cryptoiden. Verh. z.-b. Ges. Wien, 1870, xx, pp. 109–156.

Contains descriptions of 51 species (mostly of *Cryptus*), whereof 39 are treated as new, and characters of one new genus.

——. Neue Beiträge zur Kenntniss der österreichischen Cryptoiden. *L. c.* pp. 403–430.

The acquisition of fresh material enables the author to add

many observations to the species recorded in his first communication. He also describes eight more new species, and characterizes one new genus.

WALSH, BENJAMIN D. On the group Eurytomides of the Hymenopterous family Chalcididæ: with remarks on the theory of species, and a description of *Antigaster*, a new and very anomalous genus of Chalcididæ. Amer. Ent. & Bot. ii. pp. 297-301, 329-335, 367-370, figs. 1-10.

This posthumous paper was intended by Walsh to form an appendix to an article on the "Joint-worm" (*Isosoma hordei*) published in Amer. Ent. i.; and species described in it are referred to in that article, pp. 156 & 157; but his final conclusion was to publish it in Trans. Amer. Ent. Soc. Cresson, however, after Walsh's death, returned the paper to Riley, who published it as above, completing the description of *Antigaster* by the characters of ♀, bred by him. One new genus and 14 new species are characterized in it, and many original and most interesting observations are incidentally made upon dimorphism &c. in *Cynips*.

——. On a species of *Hemiteles* (*Ichneumonidæ*) ascertained to be parasitic in Canada on the imported Currant Worm-fly (*Nematus ventricosus*, Klug). Canad. Ent. ii. pp. 9-12 (Oct. 1869).

Contains general observations upon, and a table of, the American species of *Hemiteles*, with description of one new species.

SMITH (Pr. E. Soc. 1870, p. xix) gives a list of *Hymenoptera* collected at Nagasaki by Lewis, of which about twenty appear to be undescribed. On the whole, this collection is stated to be decidedly European in appearance.

COUPER (Canad. Ent. ii. p. 68) briefly describes an unknown Hymenopterous gall at the roots of the raspberry, Ottawa and Labrador.

GILLET DE GRANDMONT (Bull. Soc. Acclim. 2nd ser. vi. p. 299) gives an account of a bee-hive constructed by Vançon.

ANTHOPHILA.

Andrenides.

Thomson (Opusc. Ent. pp. 305-316) describes 35 Swedish species of *Hyleus*, *Halictus*, *Colletes*, and *Rhophites*, of which three are treated as new, one (*Hal. abdominalis*, Panz., = *cylindricus*, F.) evidently by accident.

Prosopis levigata, Eversm., = *propinqua*, Nyl.: Moraw., Hor. Ent. Ross. vii. p. 324.

HENSEL (B. E. Z. xiv. p. 190) suspects *Prosopis annularis*, Sm., to be the ♀ of *P. dilatata*, Kby.

Hyleus pictipes, Nyl., = *annularis* (Kby.); *H. dilatatus* (Kby.) = *annulatus* (L.): Thoms. l. c. p. 306.

Halictus villosulus, Nyl., ♀ = *4-notatus*, ♂ (Kby.); *H. subfasciatus*, Nyl., ♀ = *lævis* (Kby.): Thoms. l. c. p. 309.

Nomia difformis (Panz.) = *femoralis* (Pall., 1778): Moraw. l. c.

Morawitz (Hor. Ent. Ross. vii. Bull. p. xix) records *Andrena pilipes* and *A. fulvicrus* bearing each a larva of *Meloe* between the 1st and 2nd segments of the back of the abdomen. The *A. pilipes* had also a small larva of *Lytta* among the hairs of its thorax.

SCHENCK (S. E. Z. xxxi) discusses at some length his difficulties concerning the following species:—1. *Andrena combinata* (Chr.), *propinqua*, *afzehiella*, and *consobrina*, Schk., pp. 407–409; 2. *A. guynana*, K., *æstiva*, Sm., and *bicolor*, Nyl., p. 410; 3. *A. præcox* (Scop., *smithella*, K.), *varians* (Rossi), and *fucata*, Sm., p. 411; 4. *A. trimmerana*, K., and *apicata*, Sm., p. 413.

Andrena. Thomson (l. c. pp. 140–156) describes 39 Swedish species, of which 6 are new (one, *A. cineraria*, evidently by accident). *A. guynana*, Kby., = *bicolor*, F.; *A. barbatula*, Zett., = *albicus*, Kby.; *A. cinerascens*, Nyl., = *nasalis*, Kby.

Andrena holomelana, Lep., *fuscata*, Eversm., = *morio*, Brullé, Moraw. l. c. p. 321; *A. labrosa*, Eversm., = *Systropha curvicornis* (Scop.), Moraw. l. c. p. 314.

New species:—

Prosopis leptocephala, Moraw. l. c. p. 324, Saratov.

Prosopis gerstæckeri, Hensel, B. E. Z. xiv. p. 184 (♀ Berlin).

Sphécodes reticulatus, p. 98, *pilifrons* and *puncticeps*, p. 99, *crassus*, p. 100, Sweden: Thoms. l. c.

Hyleus marginatus, Thoms. l. c. p. 306, and *H. clathratus*, p. 307, Sweden.

Halictus. Schenck (l. c.) describes the following new species:—*H. laticeps*, *appropinquans*, *clypeatus*, p. 305, *striatus*, *simillimus*, *ferrugineipes*, *parumpunctatus*, p. 306 (all presumably from Nassau); *fasciatellus*, Austria, *linearis* (♀ Nassau), p. 307; *megacephalus*, Prussia, *semipunctulatus*, Bonn., p. 308; *intermedius*, Pomerania, *transitorius*, Austria, p. 309; *lucidus* and *tarsatus*, ibid., *6-striatus*, and *brevicornis*, p. 310, *6-signatus*, p. 311, Westphalia; *hirtellus*, ibid., Lethmathe, Mark.

Andrena angustipes, p. 293, Nassau; *confusa*, p. 299, Austria; *interrupta*, Thuringia, *nitens*, Cassel, *gracilis* (no loc.), p. 300; *ciliata*, p. 375, Lippstadt: Schenck, l. c.

Andrena violascens, p. 151, *intermedia* and *albofasciata*, p. 154, *curvungula* and *integra*, p. 155, Sweden: Thoms. l. c.

Andrena intermedia, Moraw. l. c. p. 321, Russia, Siberia; *A. erythrocnemis*, Moraw. l. c. p. 322, Sarepta.

Apides.

SCHENCK (S. E. Z. xxxi. p. 104) records *Phileremus rufiventris* (Först., = *Pa-sites maculatus*, Jur., *teste* Gerst.) with very short max. palpi, apparently non-articulate. He states that his *Pasites punctatus* = *Phil. nasutus*, Gerst., and points out its structural peculiarities. It frequents *Betonica officinalis*, in company with *Rhopites 5-spinosus*.

Epochus luctuosus, Eversm. (nec Spin.), = *speciosus*, Gerst. : Moraw. l. c. p. 326.

Ceiozys 8-dentata, Lep., *rufocaudata*, Smith, *erythropyga*, Först., = *brevis*, Eversm.; *C. emarginata*, Först., ♀ = *coronata*, Först., ♀: Moraw. l. c. p. 319.

Ceiozys umbrina, Sm., perhaps = *rufescens*, Lep., according to Schenck (l. c. p. 105), who makes some general observations upon the allies of *C. elongata*, Lep., but which will scarcely bear analysis, as the author admits his difficulty in discriminating between species and variety in this genus. He refers to the diagnostic characters of his *C. claripennis*. *C. apiculata*, Först., ♂ = *divergens*, Först., = *simplex*, Nyl.; *C. erythropyga*, Först., = *rufocaudata*, Sm., ♀ = *octodentata*, Duf. : Schenck, JB. Ver. Nass. xxi. & xxii. p. 353.

Diozys tridentata is a parasite on *Osmia adunca* : Moraw. l. c. p. 321.

GIRAUD (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xliii) records a ♂ of a *Dufouria* (? *dejeanii*, Lep.) from Agen, which, having a spinule on each side of sixth segment of abdomen, he thinks justifies Latreille's name of *armatus* (*Panurgus*).

BELLEVOYE (*ibid.* p. xxxvi) notes that the cocoons of *Osmia bicornis* occur singly in shells of *Helix nemoralis* and *hortensis*, whereas they are found even up to the number of six in *H. pomatia*. Giraud (*ibid.*) notes that this *Osmia* is much more often found in *H. nemoralis* than in *H. pomatia*.

LICHTENSTEIN (*ibid.* p. xlv) records the economy of a species resembling *Osmia leucomelana* (K.), but generically distinct, and which establishes itself in old nests of *Pelopæus pectoralis*, Duf.

Osmia cementaria, Gerst., ♀ = *spinola*, Lep., and *O. claripennis*, Schk. (*anthocopoides olim*), = *adunca*, var. *constans*, teste Schenck (S. E. Z. xxxi. p. 106), who considers that he has a ♀ example connecting *cementaria* and *adunca*.

Osmia leucomelana, Smith, is certainly not identical with Kirby's insect of the same name, and = *interrupta*, Sek. : Schenck, *ibid.* p. 107 [cf. Gerst. and Moraw. Zool. Rec. vi. p. 309].

Lithurgus cornutus ♂ (Lep., Schk. JB. Ver. Nass. 1868, p. 332) ♀ = *Osmia acuticornis*, Duf. : Schenck, *ibid.* p. 107.

LICHTENSTEIN (Pet. nouv. 1 Aug. 1870, p. 108) refers to an insect which he states should, according to Giraud's opinion, form a genus between *Heriades* and *Osmia*. This he names *Osmia glutinosa*, but without any description or note of locality. He states that it deposits its eggs and larval food in an unknown glutinous matter.

Megachile argentata (F.) is recorded by Ritsema in Tijdschr. Ent. 2nd ser. Deel v. p. 182, as using *Polygonum convolvulus* for its nest-lining.

Nests of *Anthidium contractum* and *A. ornatum*, and (?) of *Osmia cyanea* are mentioned by Lichtenstein (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. ix).

The max. palpi of *Ceratina cucurbitina* and *C. cyanea* are 6-jointed, not 5-jointed, as Gerstäcker opines. Schenck, JB. Ver. Nass. xxi. & xxii. p. 353.

A nest in a hollow currant-stem, referred with some little doubt to *Ceratina dupla* (Say), is described and figured in Amer. Ent. & Bot. ii. p. 214, f. 134.

Macrocera dentata, Eversm., = *Tetralonia pollinosa*, Lep.; *Eucera antennata* (F.) = *T. malva* (Rossi): Moraw. l. c. p. 314.

Eucera cana, *crinita*, and *cantatrix*, Bär., *cineraria*, Eversm., *pollinosa*, Smith, = *cimerea*, Lep.: Moraw. l. c. p. 312.

MORAWITZ, l. c. p. 307, redescribes fully *Anthophora lepida* (Pallas), from Sarepta, and adds characters for *A. binotata*, Lep. *A. pubescens*, Lep., = *flabellifera*, Lep., ♀.

Xylocopa violacea is recorded from Kholm, in Russia, below 57° 29' lat. N., by Essaouloff (Trav. prem. Assembl. nat. de Russ.).

GIBARD (Ann. Soc. Ent. Fr. 4^e sér. ix. Bull. p. lxx) records ♂ *Xylocopa violacea* with partly transparent wings.

Xylocopa carolina (L.) and *Anthophora sponsa*, Sm., are figured, and details of their habits given, in Amer. Ent. i. p. 9, f. 4 & 5.

LOWNE (Journ. Quekett Micros. Club, 1870, p. 46) records some observations on the structure of the cornea of a S.-African *Xylocopa*.

SCHENCK (S. E. Z. xxxi. p. 106) adduces instances of colour-variation, with the apparent but unexpressed idea of not allowing specific value to *Bombus marteus*, Gerst. He strengthens the collocation of *B. lucorum* and *B. terrestris*, L., as one species; *B. soroensis*, K., Lep., = *subterraneus*, L.; *B. colinus*, Sm., *proteus*, Gerst., = *soroensis*, F., ♂: teste Schenck, *ibid*.

Bombus acervorum, L., = *subterraneus*, L., of which the ♂ is *latreillellus* (Kby.) [but see Smith, Cat. Brit. Ap. p. 231]; *B. sylvarum*, Panz., ? = *burrellianus*, Kby. [cf. Smith, l. c. pp. 217, 220, 227]: Thoms. l. c. p. 252 *et seq*.

BETHUNE (Canad. Ent. ii. p. 68) records a humble-bee's nest made in a buffalo's skin.

SHIMER (P. Ess. Inst. vi. p. 5) observes ♂ humble-bees fanning the entrance of a nest, in their excitement to obtain access to the ♀ ♀ within.

Apis. The geographical distribution of the various honey-bees is given by Schenck (JB. Ver. Nass. xxi. & xxii. pp. 272 & 273), who adds a list of authors on the economy of *A. mellifica*.

For an exposition of Munn's views, in dissension from Dzierzon and von Siebold, as to the earlier development of *Apis mellifica*, and especially of the queen, cf. Pr. E. Soc. 1870, pp. xxiv-xxviii.

KAWALL (S. E. Z. xxxi. p. 110) records enormous swarmings of the honey-bee.

Ammobatoides [*nec* Radosz.], g. n., Schenck, JB. Ver. Nass. xxi. & xxii. pp. 349 & 364. Max. palpi 3-jointed; 2 cub. cells, of which the first is the larger; rad. cell broad and short; labium much longer than broad; scutell. not furcate; post-scutell. with triangular tooth. Sp. *A. bicolor* (Lep., *Ammobates*).

New species:—

Nomada robusta, p. 326, *mutabilis*, p. 328, *cinnaberina*, p. 330, *erythrocephala*, p. 331, *regalis*, p. 332, Saratov: Morawitz, l. c.

Nomada rufipes, Schk. l. c. p. 342 (*xanthosticta*, Schk. olim, *nec* K.).

Nomada 5-spinosa and *leta*, p. 93, *rufilabris* and *villosa*, p. 95, *glabella* and *punctiscuta*, p. 96, Sweden: Thoms. l. c.

Ammobates setosus, Moraw. l. c. p. 309, Saratov and Crimea.

Psites punctata, Schk. l. c. p. 346, Wiesbaden (? = *maculata*, Jur.).

- Epeolus rufipes* and *productus*, Thoms. l. c. p. 91, Sweden.
Epeoloides fulviventris, Schk. l. c. p. 339, Bamberg.
Cœlioxyris claripennis, Schk. l. c. p. 353 (presumably from Nassau).
Osmia submicans, p. 314, Tauria; *O. cephalotes*, p. 315, note, Nice; *O. dimidiata*, p. 316, Caucasus; *O. solskyi*, p. 317, Tauria, Armenia, Switzerland, Germany: Morawitz, l. c.
Megachile nigriventris, Schenck, l. c. p. 324, Tyrol.
Anthidium annulare, Schk. *ibid.*, Tyrol.
Eucera taurica, Moraw. l. c. p. 311, Tauria.
Tetralonia basalis, Moraw. l. c. p. 313, Kasan.
Anthophora ruthenica, Moraw. l. c. p. 305, Kasan, Orenburg, Sarepta.
Bombus xanthopus, Kriechb., Ver. z.-b. Ges. Wien, xx. p. 157, Corsica; *B. hematurus*, *ibid.*, Armenia; *B. niveatus*, p. 158, Palestine; *B. brevigena*, Thoms. l. c. p. 255, Sweden.
Psithyrus lugubris, Kriechb. l. c. p. 159 (♀ only, and vars. named *unicolor*, *nigricollis*, *mixta*, *collaris*, and *scutellaris*), Tuscany, Trieste, Dalmatia, Fiume.

VESPIDÆ.

WALSH & RILEY (Amer. Ent. i. pp. 122, 138-142), under the head "Wasps and their habits," discuss the economy of *Eumenes fraterna* (Say), insect and nest figured, f. 110; *Vespa maculata*, L., f. 111; *Polistes americana* (F.), insect and nest, f. 112; and other species.

SMITH (Ent. Ann. 1871, pp. 64-70) notes various parasites on the *Vespidæ*.

For observations as to the real or supposed identity of the European and American *Vespa vulgaris*, and on the occurrence in N. America of *V. crabro*, cf. Amer. Ent. i. p. 200.

The parasitism of the dipterous *Phora* on the larva and pupa of a wasp, and on the imago of *Vespa crabro*, is recorded in Pr. Ess. Soc. 1870, p. xxxviii.

COUPER (Canad. Ent. ii. p. 49 *et seq.*) gives an account of the nidification and habits of *Vespa maculata* and *V. germanica*, and of *Euceros burrus*, Cresson, the parasite of the former.

The habits of *Vespa maculata*, L., are recorded by Gillman in Amer. Ent. & Bot. ii. p. 187.

Polistes gallica. For v. Siebold's article on parthenogenesis in this species, cf. Z. wiss. Zool. xx. pp. 236-242; and for comments on it, cf. Mäklin, Cefv. Fin. Soc. xii. pp. 112-118; Kraatz, B. E. Z. xiv. pp. 47, 48; Breyer, Ann. E. Belg. xiii. c.-r. p. xii.

CHAPMAN (Ent. M. M. vi. p. 214) records observations on the pairing of *Odynerus spinipes*.

LICHTENSTEIN (Ann. Soc. Ent. Fr. 4^e sér. ix. Bull. p. lxxiii) records his observations on the economy of *Rhygchium oculatum*, which makes its nests in rose-trees, and destroys the larvæ of *Plusia gamma*. He notices a kind of false pupa in this species. An *Odynerus*, to which he refers without giving its specific name, is subject to the parasitism of *Rhipiphorus præustus*, and of a *Rhipiptera*, the latter not preventing the final metamorphosis of the wasp. He suggests the encouragement of the species of *Eumenes*, *Odynerus*, and *Rhygchium* in gardens, as a natural means of checking the excess of larvæ of *Lepidoptera*.

LICHTENSTEIN (Ann. Soc. Ent. Fr. 4^e sér. ix. Bull. p. lxxii) describes the habits of *Celonites apiformis*, which hides its wings beneath its abdomen in repose.

New species:—

Polistes panamensis, p. 439, Panama; *P. semiflavus*, ibid., Guam; *P. erythrinus*, p. 440, Sydney: Holmgren, Eugénie Resa, Ins. i.

Polybia saussurei, p. 440, California and Puna; *P. bohemani*, p. 441, L. St. Joseph: Holmgr. l. c.

Rhygchium nigripenne, Holmgr. l. c. p. 441, Honolulu.

Odynerus pubescens, *ungularis*, and *chypealis*, p. 85, *tomentosus*, *tristis*, and *dentisquama*, p. 86, *callosus* and *excisus*, p. 87, Sweden: Thomson, l. c.

Odynerus (Symmorphus) debilis and *walskianus*, p. 55, N. America; *O. (Ancistrocerus) clarazianus*, ibid., La Plata; *conspicius*, p. 56, Mexico; *O. (s. s.) tapiensis*, Quito, *argentinus*, La Plata, ibid.; *laplatæ*, La Plata, *sonatus*, Cayenne, *californicus*, California, p. 57; *cordovæ*, Mexico, *scutellaris*, California, *bidens*, Florida, p. 58; *arvensis* and *annectens*, N. America, *formosus*, Mexico, p. 59; *spectabilis*, Cuba, *turpis*, N. America, *clavicornis*, Mexico, p. 60; *molestus*, *pratensis*, and *collega*, p. 61, N. America; *xanthianus*, p. 103, S. California; *kennicottianus*, N. America, *propinquus*, Mexico, *texensis*, Texas, *fasciculatus*, Cuba, p. 104; *blandus*, California, *nortonianus*, N. America, *inca*, Peru, p. 105; *coyotus*, p. 106, *zendalus*, *nahuus*, and *olmecus*, p. 140, Mexico; *O. (Epipona) dilectus*, p. 141, N. America: Saussure, R. Z. 1870.

Pterochilus aztecus and *P. mexicanus*, Saussure, l. c. p. 141, Mexico.

Alastor mexicanus, Saus. ibid., Mexico.

FOSSORES.

WALSH & RILEY (Amer. Ent. i. pp. 122-138) give a general outline of the characters of the *Fossores*, and discuss the economy and give figures of the following North-American species:—*Chlorion ceruleum* (Drury), f. 97; *Bembex spinolæ*, Lep., f. 98; *Sphex ichneumonea* (L.), f. 99; *Ammophila pictipennis*, sp. n., f. 100; *Pepsis formosa* (Say), f. 101; *Stizus grandis* (Say), f. 102; *S. speciosus* (Drury), f. 103; *Pelopæus lunatus* (F.), f. 104; *Agema bombycina*, Cresson, f. 106 (also mud-cells of other *Ageniæ*, f. 105); *Trypoxylon albitarse* (F.), f. 107; *Ceropales rufiventris*, sp. n., f. 108. At pp. 162-164 is an appendix by Walsh, and descriptions of the new species &c.

Philanthides.

Philanthus interruptus (Panz.) is not, as Smith states, identical with *Crabro* 5-fasciatus (Rossi), according to Costa (Ann. Mus. Nap. v. p. 101, note), who has types of both species. Panzer's fig. of *P. 5-cinctus* is ♂ var. of *arenaria* (L.), and not 5-fasciatus (Rossi), as quoted by Smith: Costa (l. c. p. 104, note). Panzer's fig. of *P. sabulosus* is not to be referred to *C. 4-cincta*, as Smith considers, but to *emarginata* (Pz.): Costa (l. c. p. 107, note).

Cerceris 4-cincta, Dbm., = *truncatula*, Dbm.: Thoms. l. c. p. 248.

Cerceris. Costa, l. c., describes the following new species from Italy:—*C. laminifera*, p. 97, Piedmont; *scutellaris*, p. 98, Sardinia and Naples; *specularis*, p. 101, Calabria; *fuscipennis*, Piedmont, Tuscany, *luctuosa*, Piedmont, p. 105;

lunata, p. 106, Calabria; *funerea*, p. 108, Sicily; *brutia*, p. 109, Calabria; *variolosa*, Benevento, *geneana*, Sardinia, p. 111.

Crabronides.

The economy of *Trypoxylon* is discussed by Ritsema (Tijdschr. Ent. 2nd ser. Deel v. p. 183).

Crabro affinis, Wesm., = *pubescens*, Shuck.; *C. melanarius*, Wesm., = *carbonarius*, Dbm.; *C. ambiguus*, Dbm. (♀ = *capito*, Dbm.), = *gonager*, St.-Farg.; *C. vicinus*, Dbm., = *podagricus*, v. d. Lind.; *C. transversalis*, Dbm. [? Shuck.], = *anxius*, Wesm.; *C. patellatus*, Dbm., = *peltarius* (Schreb.); *C. pterotus*, Dbm., = *scutellatus* (Scheven); *C. interruptus*, Dbm., = *4-cinctus* (F.): Thoms. l. c. pp. 156 et seq.

Oxybelus mucronatus (Dbm. nec Fab., = *14-notatus*, Dbm. nec Jurine) is re-named *aculeatus*, Thoms. *ibid.* p. 177; *O. 3-spinosus*, Dbm., = *nigripes* (Ol.); *O. bellus* and *nigricornis*, Dbm., = ♂ *fasciatus*, Dbm. [cf. Smith, Cat. Brit. Foss. p. 166]; *O. simplex* and *continuus*, Dbm., = *dubius*, Dbm., of which *O. nigripes*, Dbm., is the ♀; *O. furcatus*, St. F., = *mucronatus* (F.); *O. hamorrhoidalis*, Dbm., = *3-spinosus* (F.): Thoms. *ibid.*

Diodontus medius and *D. tristis* [? v. d. L.], Dbm., = *dahlbomi*, Morav.; *D. pallipes*, Dbm., = *tristis*, v. d. L.: Thoms. l. c. p. 236.

Passalacus insignis, Dbm. [? v. d. L.], = *brevicornis*, Morav.; *P. borealis*, Dbm., = *turionum*, Dbm.; *P. singularis*, Dbm., = *gracilis* (auct.) [? Curtis]: Thoms. l. c. p. 237 et seq.

Crabro inermis, p. 162, *mucronatus*, p. 167, *cavifrons* and *planifrons*, p. 173, spp. nn.: Thomson, l. c.

Pemphredon podagricus, sp. n., Chevrier, Mitth. schw. ent. Ges. iii. p. 268, Nyon, Switz.; *P. carinatus* and *P. clypealis*, spp. nn., Thoms. l. c. p. 236, Sweden.

Cemonus strigatus, sp. n., Chevrier, l. c. p. 269, Switzerland.

Psen distinctus, sp. n., Chevrier, l. c. p. 269, Nyon.

Nyssonides.

Stizus speciosus, Drury, is stated by Bryant (Am. Ent. ii. p. 87, fig. 57) to act as a "horse-guard," by playing round horses and catching flies attracted to them. An editorial note (*ibid.*) suggests an error in this, as *Stizus* provisions its nest with grasshoppers, and hints that a *Bembex*, coloured like the species above named, is most likely intended by Bryant, as the insects of that genus store their nests with *Athericidae*. The habits of *S. grandis* (Say) are referred to, *ibid.* i. p. 8, f. 3.

Nysson interruptus, Dbm. [? nec F.] = *shuckardi*, Wesm.; *N. omissus*, Dbm., = *maculatus*, ♂ (F.): Thoms. l. c. p. 244.

Hoplus latifrons, Dbm., = *5-cinctus* (F.): Thoms. l. c. p. 246.

CHEVRIER (l. c. p. 272) describes an insect as the ♂ of *Hoplus* (*Psammæcius*) *punctulatus* (St. F.), considering the ♂ attributed to that species by St. Fargeau to belong to some other species, and that the author probably established his genus *Psammæcius* on the peculiar structure of the apical joints of its antennæ. He thinks, also, that the ♂ of *Gorytes punctulatus* (v. d. Lind.) cannot be referred to *punctulatus* (St.-F.), and notes individual variations in *Eusponus laticinctus* (St.-F.).

New species :—

Stizus brevipennis, Walsh, Amer. Ent. i. p. 162, Rock Island, Illinois, U.S.

Nysson variolatus, Costa, l. c. p. 72, Otranto.

Lestiphorus bilunulatus, Costa, l. c. p. 75, Canavese.

Hoplisis sinuatus, Tuscany, Naples, and *H. sulcifrons*, Sardinia, p. 81, *craverii*, p. 83, Brà : Costa, l. c.

Hoplisis eburneus, Chevrier, l. c. p. 270, Nyon.

Larrides.

Miscophus spurius, Dbm., = *niger*, Dbm. : Thoms. l. c.

New species :—

Larrada polita, Congonh, and *L. semiargentea*, S. America, p. 3; *L. plebeia*, p. 4, Lagoa Santa; *L. nuda*, p. 5, Venezuela; *L. gastrica*, ibid., Parana, Banda Oriental, Venezuela; *L. angustata*, p. 6, Lagoa Santa; *L. appendiculata*, p. 7, Congonh : Taschenberg, Z. ges. Naturw. 1870, ii.

Morphota tridens, Tasch. l. c. p. 8, Lagoa Santa.

Tachytes chypeatus, p. 10, Parana; *T. scalaris*, p. 11, Mendoza; *T. ruficaudis*, p. 12, N. Friburg, Parana; *T. rhododactylus*, Mendoza, *T. setosus*, Lagoa Santa, p. 13; *T. fraternus*, p. 14, Mendoza; *T. costalis*, p. 15, Parahybuna, Parana : Taschenberg, l. c.

Tachytes lativalvis, Thoms. l. c. p. 242, Sweden.

Astata lugens, Tasch. l. c. p. 16, Mendoza, Banda Oriental; *A. gigas*, Tasch. l. c. p. 17, N. Friburg.

Miscophus exoticus, Tasch. l. c. p. 17, Rio Janeiro.

Pison convexifrons, Tasch. l. c. p. 18, N. Friburg, Rio Janeiro.

Bembecides.

Varieties of *Monedula punctata* (F.), variously known as *arcuata*, *flexuosa*, and *decorata*, are mentioned by Taschenberg, l. c. p. 22.

Bembex citripes, sp. n., Taschenb. l. c. p. 19, Mendoza; *B. 4-maculata*, sp. n., p. 20 (unknown locality).

Monedula guttata, sp. n., p. 23, Banda Oriental; *M. notata*, sp. n., p. 24, Parana; *M. singularis*, sp. n., p. 25, Mendoza; *M. discisa*, sp. n., p. 26, Rio Janeiro, Parana, Banda Oriental : Tasch. l. c.

Sphegides.

WALSH (Amer. Ent. i. p. 164) tabulates the N.-American genera, and notes the confusion in names of three "Blue wasps."

Ammophila pictipennis, sp. n., Walsh, l. c. f. 100, S. Illinois, U.S.A.

Pompilides.

LICHTENSTEIN (Pet. Nouv. 27, p. 108) records his having bred *Pompilus niger* from a larva found in July 1869, fixed on the back of a spider, which it eventually entirely devoured. He notes this circumstance as a unique instance of a *Pompilus* simulating *Ophion*, *Scolia*, and *Chrysis* in habit,—all other species known to him having been bred from cells provisioned by the mother.

BELLEVOYE (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xxxvi) mentions an agglomeration of earthy cells, each enclosing a white cocoon, in *Helix pomatia*, from which he has bred a species of *Pompilus*.

Pompilus neglectus, Wesm. (♂ = *minutissimus*, Dbm.), = *cellularis*, Dbm.; *P. neglectus*, Dbm., = *spissus*, Schdt.; *P. spissus*, Dbm., = *fuscomarginatus*, Dbm.; *P. difformis*, Schdt., = *dispar*, Dbm., ♂; *P. anceps*, Wesm., = *trivialis*, Dbm.; *P. trivialis*, Wesm., is renamed *wesmaeli*; *P. bilineatulus*, ♂, Dbm., = *pectinipes*, Wesm., is renamed *dalbomi*: Thomson, l. c. p. 218 *et seq.*

Agenia hyalinipennis, Dbm., = *albifrons* ♀, Dbm.: Thoms. l. c. p. 226.

The ♂ of *Agenia architectus* (Say) is described for the first time by Walsh (l. c. p. 163), who notes characters and economy of *A. cupida* and *bombicina*; Cresson.

Prionemis coriaceus, Dbm., = *gibbus* (F.): Thoms. l. c. p. 227.

The ♂ of *Ceropales longipes*, Smith, = *fasciata* (Say) is described by Walsh, l. c. p. 163.

Pompilus unguicularis, sp. n., p. 221, *P. aculeatus*, sp. n., p. 224, Sweden: Thoms. l. c.

Agenia subcorticalis, sp. n., Walsh, l. c. p. 162, f. 105 c, N. America.

Ceropales rufiventris, sp. n., Walsh, l. c. p. 163, f. 108, Illinois, U.S.A.

Sapygides.

Sapyga variegata, Dbm., = *similis* (F.): Thoms. l. c. p. 210.

Scoliades.

SMITH (Ent. Ann. 1871, p. 57) records his opinion that *Tiphia femorata* (F.) is parasitic upon *Aphodius*.

MUTILLIDÆ.

Mutilla. The following synonymy and observations occur in Sichel & Radoszkovsky's 'Essai,' Hor. Ent. Ross. vi. (for commencement, see Zool. Rec. vi.):—*M. incompleta*, Wesm., = *distincta*, Lepel., p. 173; *M. fraterna*, Baer, = *glabrata* (F.), p. 176; *M. continua* (Ol. & Smith nec Fab.) is named *subcontinua*, p. 178; *M. europæa* (Cyril, Rossi), Jur., *continua* and *ciliata* Lep., *iberica*, Kol., 5-fasciata, Rados. & Savig., = *littoralis* (Petg.), p. 180; *Apis aptera*, Udde, *A. simile*, Harris, *M. panzeri*, *cyanea*, and *cærulans*, Lepel., *obscura*, Nyl., and *kachiriensis*, Baer, = *europæa* (L.), p. 114; *M. argentata* (Villers), *collaris* ♂ (F.), *luctuosa* and *tabida*, Luc., *bifasciata* and *abulosa*, Kl., *aucta* and *austriaca*, Lep., *parens*, Cost., *arenaria* and *barbara*, Coq., = *hottentota* (F.), p. 189 (for particulars of economy see p. 303); *M. rondani*, Spin., probably = *hottentota* ♂, var. *tabida*, p. 191; *M. caspica*, Kol., and (?) *funeraria*, Er., = *bicolor* (Pall. nec Ol.), *ibid.*; *M. simpla*, Radosz., is renamed *pauperata*, p. 195; *M. sellata*, Rad., and *nigrita*, Gir., = *montana* (Pz.), p. 196, of which probably *uncinata*, Luc. (errore *unicincta*), is an Algerian var., p. 199; *M. ephippium* and *nigrita* (F.), *nigra* (Rossi), *calva*, Shuck., *bimaculata*, Jur., *scutellaris* (Ol.) = *rufipes*, Latr., p. 200, of which *subcomata*, Wesm., is possibly a var., p. 202; *M. vittata* (Ol.) ♀ is figured, t. viii. f. 7; *M. erythrocephala*, Latr., *dorsata* (Ol.), *excoriata* and *punctum*, Lep., = *spinolæ*, Lep., p. 205, t. ix. f. 7; the males of the series of that and

M. stridula are sectionized, *ibid.*, note; *M. dorsata* (F.) is treated as practically non-existent, p. 207; *M. coronata* and *pedemontana* (F.), *pedemontana*, Perris, *viduata*, Pall., *marquarti*, Lepel., = *stridula* (Rossi), p. 209; *M. collaris* (F.), *togata* (Germ.), *nilotica*, Kl., *luctuosa* and *bartolomei*, Rad., = *tunensis* (F.), p. 211; *M. tunensis* (Ol.) = *ornata*, Kl., p. 213; *M. elegans*, Kl., *unipetiolaris*, Rad., = *regalis* (F.), p. 216; *M. bipunctata*, Latr., ? = *chiesi*, Spin., p. 217; *M. biguttata*, Costa nec Lepel., = *halensis* (F. nec Ol.), p. 218, of which *myrmecium*, Pall., is probably a var., *halensis* (F.) itself being probably only a var. of *bituberculata*, Sm.; *M. tuberculata*, Lep. nec F., *bipunctata*, Latr., *halensis* (Ol. nec F.), *angusticollis*, Spin., = *bituberculata*, Smith, p. 219, t. vii. f. 9, 10; *M. interrupta*, Rad. nec. Ol., = *paripuncta*, Pall. MS., p. 222; *M. representans*, Smith, = *interrupta* (Ol.), p. 223; *M. astarte*, Sm., = *cephus*, Sm., p. 230; *M. sycorax*, Sm., is figured, t. viii. f. 4; *M. pusilla*, Kl., *trinotata*, Cos., *triangularis*, Rad., = *4-punctata* (Ol.), p. 234; *M. unimaculata*, Luc., = *partita*, Kl., p. 235; *M. villosa*, Kl., = *sinuata* (Ol.), p. 237; *M. austriaca* (Panz.), *differens*, Gir., *sungora* and *4-maculata*, Pall., = *maura* (L.), p. 239, which itself may be only a form of *M. arenaria* (F.); *M. lepida*, Kl., *armeniaca*, Kol., *mongolica* and *desertorum*, Rad., *oraniensis*, Luc., = *arenaria* (F.), p. 242, which species the authors separate into three divisions; *M. sexmaculata*, mentioned by Smith as taken in cop. with *fuscipennis*, is not Sweder's species of the former name, p. 247; *M. barbara* (F.), *algira*, Lep., *8-maculata*, Spin., *9-guttata*, Kl., *rubricollis* and *dorsalis*, Luc., = *maroccana* (Ol.), p. 248; *M. sexmaculata* (Cyril.), *hungarica* (F.), *calva* (Pz.), *monspeliensis*, Lep., *sericeiventris* and *decoratifrons*, Costa, *barbara* (L.), *maculosa* (Ol.) = *brutia* (Petagna), p. 250, t. x. f. 8; *M. 5-punctata* (Ol.) = *5-maculata* (Cyril), p. 253, t. ix. f. 6; *M. mephitis*, Smith, of which *flabellata* (F.) is possibly the ♂, is figured, t. ix. f. 3; *M. leucopyga*, Smith nec Klug, = *sexmaculata*, Smith nec Sweder, and is renamed *tetraops*, p. 257; *M. rugosa* (Ol.) is figured, t. ix. f. 4, and *M. bengalensis*, Lep., is apparently a var. of it, p. 260; *M. tristis*, Klug, Walil (nec Ent. Brasil.), *concolora*, Rad., = *lugubris* (F. nec Burm.), and is possibly only a var. of *italica* (F.), p. 262; *M. italica* is not, as Smith considers, a syn. of *stridula*, R., p. 263; *M. atra*, Smith, = *atrata*, Ol., is figured, t. x. f. 8, and renamed *olivieri*, p. 264; *M. arabica* (Ol.) is figured, t. ix. f. 10, and is very probably the ♂ of *ornata*, Kl., p. 268; *M. atrata*, Smith nec Ol., is renamed *godefredi*, p. 271, and figured t. x. f. 1; *M. argenteo-fasciata*, Costa, = *rubricans*, Lep., p. 273; *M. cinerascens* (Ol.) is figured, t. x. f. 3, *M. melicerta*, Smith, *ib.* f. 4 (and is possibly the ♂ of *aureomaculata*), *M. egregia*, Kl., *ib.* f. 5, *M. obliterata*, Smith, *ib.* f. 6; *M. confusa*, Lep., *M. discoidalis*, Rad., and *Ronisita torosa*, Costa, = *ghilianii*, Spin., p. 279 (Sichel in a note, p. 280, suggests that the latter is the ♂ of *5-punctata*); *M. charaxus*, Smith, is figured, t. x. f. 10; *M. bicolor*, Luc., = *rubrocincta*, Luc., which, if different from *montana*, is most likely to be the ♂ of *uncinata*, Luc., p. 284; *M. fuscipennis* (F.), *rufogastra*, Smith, = *analis*, Lep., and is the ♂ of the authors' *M. vicina*, according to Sichel, p. 285; *M. rufogastra*, Lep., *6-maculata* and *indostana*, Sm., = *dimidiata*, Lep., p. 285; *M. medon*, Sm., is figured, t. xi. f. 1; *M. spinigera*, Lep., = *floralis*, Kl., p. 290; *M. græca*, Lep., is figured, t. xi. f. 2; *M. affinis*, Luc., = *grisescens*, Lep., p. 291; *M. histrio*, Lep., is figured, t. xi. f. 3, *M. acheron*, Sm., *ib.* f. 5, *M. alecto*, Sm., *ib.* f. 6; *M. bicolor* (F. nec Pall.) is renamed *dichroa*, p. 300, and figured, t. xi. f. 7; *M. tricineta*, Jurine (? descr. published

before, and probably from Equatorial Africa, and not from Italy, as Jurine's insect is labelled), is figured, t. xi. f. 8; the economy of *M. capitata*, Luc., is noted, p. 303; *M. egregia*, Sauss. nec Kl., is renamed *aureorubra*, p. 304; *M. capensis*, Sauss., seems to be a minor form of *continua* (F.), p. 309.

Sichel & Radoszkovsky (*l. c.*) describe the following new species:—*Mutilla kevigata*, p. 177, t. vii. f. 2, Isère; *scabrofoveolata*, p. 180, t. vii. f. 6, W. Africa; *stribligata*, p. 182, Greece, Algiers; *disparimaculata*, p. 183, t. viii. f. 1, Senegal; *ovata*, p. 184, Caffraria (?=*flabellata*, F., ♂); *simplifascia*, p. 192, t. vii. f. 3, 4, Gilolo; *nigroaurea*, p. 193, t. vii. f. 5, Africa (of which the authors think their S.-American *melanochrysa*=♂); *lucasi*, p. 199, Algeria; *cordigera*, p. 202, t. vii. f. 8, China; *pondicherensis*, p. 204, Pondicherry; *bicoculata*, p. 224, t. viii. f. 2, Senegal; *argenteopicta*, p. 226, t. viii. f. 3, Africa; *accedens*, p. 227, Manilla; *vicina*, Amboyna, and *subintrans*, Ceylon, Timor, p. 228; *pectinata*, Senegal, t. viii. f. 5, and *dispilota*, Africa, f. 6, p. 233; *chrysococcina*, p. 236, t. viii. f. 8, Persia (of which *M. speciosa*, Smith, from China, is an imperfectly described var.); *multispina*, p. 237, t. viii. f. 9, Senegal; *trispilota*, p. 238, N'gami; *ceylanensis*, p. 247, Ceylon; *diselena*, p. 248, t. viii. f. 10, Senegal; *aureomaculata*, p. 255, t. ix. f. 1, Crimea (?=*maura*, var., in which case *M. melicerta* would be its ♂); *rubroaurea*, p. 256, t. ix. f. 2, Africa; *perisii*, p. 261, t. ix. f. 5, Corsica; *calcariventris*, p. 265, t. ix. f. 9, Montpellier, Algiers; *erythrothorax*, p. 266 (no loc. given); *persica*, p. 269, Persia; *carinata*, p. 272, t. x. f. 2, Corsica (possibly a ♂ var. of *M. brutia* or *M. maura*); *cypria*, p. 273, Algeria, Cyprus (possibly a var. of *M. rubricans*, Lep.); *perfecta*, p. 278, t. x. f. 7, S. Persia; *melanochrysa*, *ibid.*, Rio Janeiro; *humeralis*, p. 280, t. x. f. 9, Algeria (? *differens*, Lepel.); *hispanica*, p. 295, t. ix. f. 4, Spain; *saussurei*, p. 299, Guinea; *erschoffii* (in error *erschovii*), p. 308, Astrabad.

RADOSZKOVSKY (*l. c.* vii. Bull. pp. xix-xxi) supplements the above-mentioned monograph by the observations that *M. austriaca* (*maura* ♂) has been bred by Giraud from nests of *Ammophila heydeni*, and *M. coronata* by Sichel from a colony of *Larra anathema*; that *M. parvicollis*, Costa, is the ♀ of *capitata*, Luc., and is parasitic upon a *Chrysis*; and *M. tabida*, Luc., is certainly the ♀ of *hottentota* (F.), and is parasitic upon *Leptochilus mauritanicus*,—these two *Mutillæ*, with *nilotica*, Kl., having been bred from Algerian *Helix maritima*. The author notes that the form of the first abdominal segment in the different species coincides with that of the other Hymenoptera upon which they are parasitic.

Smicromyrme, g. n., Thoms., Opusc. Ent. p. 208. Basal nerve of ant. wings reaching the postcostal considerably before the stigma; dorsal lines of mesonotum entire; apex of mandibles bidentate, in ♂ with short horn on outer side. Sp. *S. rufipes* (Latr.).

FORMICIDÆ.

Forel's apparatus for the preservation and examination of colonies of *Formicidæ* is described in Mitth. schw. ent. Ges. iii. p. 156.

Camponotus esuriens, Smith: Norton (Comm. Ess. Inst. vi. p. 1) describes its ♂ and ♀.

Camponotus ebeninus, Emery, = *lateralis* (Oliv.), var.: Emery, Bull. Ent. Ital. ii. p. 193.

MAYR (Verh. zool.-bot. Ges. Wien, xx. p. 940) quotes and partially confirms Emery's observation that *Colobopsis truncata* is the male and *C. fuscipes* the worker of one and the same species. He thinks it probable that all species of *Colobopsis* have males and workers, and considers in that case that this genus has the same relation to *Camponotus* as *Pheidole* to *Pheidologeton*. At p. 941 he tabulates the known Asiatic and Australian species of *Colobopsis*; and at p. 944 describes an insect from Tonga, apparently referable as worker to *C. rufifrons*, Smith, though in certain points so different from that species as likely to suggest the formation of a new genus for its reception.

Prenolepis lasioides, Emery, being a true *Lasius*, is renamed *fumatus*: Emery, l. c. p. 194.

Mayr (l. c. p. 947) tabulates the workers only of 9 species of *Prenolepis* (including 2 new species), and remarks that the *Prenolepis* from the Taurus, in nests of which Lederer found a *Paussus*, is identical with the S.-American *P. fulva*. At p. 949 he records *P. vividula*, Nyl., from Tonga and other islands of Oceania, with variations of colour &c.; and considers it probable that *P. obscura*, from Sydney, is the type form of this insect.

Mayr (l. c. p. 950) describes worker and ♂ of *Lasius claviger*, Rog., from Connecticut and N. York.

Formica. Mayr (l. c. p. 950) compares this genus and *Lasius*; notices the affinities of European and N.-American species of the former, especially referring to *F. cunicularia*, Latr., from Connecticut, and *F. cinerea*, Mayr, from California. He names *obscuriventris* a var. of *F. truncicola*, Nyl., from Connecticut, and indicates a new species near *F. integra*, Nyl., from California. He also mentions workers from N. York and other localities intermediate between *F. fusca*, L., and *gagates*, Latr., and states that only *F. schaufussi*, Mayr, is in any marked degree separable from the European species. The author speaks slightly of Buckley's 'Descriptions of new species of North-American Formicidæ.'

Mayr (l. c. p. 952) describes Spanish specimens of *Cataglyphis albicans*, Rog.

Hypoclinea. Mayr (l. c. p. 953 *et seq.*) remarks generally upon the relations of this genus and of *Iridomyrmex*, *Dolichoderus*, *Tapinoma*, and *Bothryomyrmex*; divides the workers of *Hypoclinea* into five groups, with observations upon the geographical distribution of that genus, and (p. 955) tabulates all the known species. *Acantholepis kirbii*, Lowne, is a *Hypoclinea*, and a good species; *Formica itinerans*, *gracilis*, and *rufonigra*, Lowne, and *Acantholepis mamillatus*, Lowne, are also to be referred to *Hypoclinea*, though with some doubts as to their specific value; *Formica smithii*, Lowne, = *H. purpurea* Sm.; *Acantholepis tuberculatus*, Lowne, = *H. nitida*, Mayr; *Polyrhachis foveolatus*, Lowne, = *H. scabrida*, Rog.; *Polyrhachis cuspidatus*, Sm., is a *Hypoclinea*. Mayr, l. c. p. 954 *et seq.*

The workers of *Liometopum*, Mayr, are to be distinguished from those of *Hypoclinea* by their possessing ocelli, and their longitudinally convex non-constricted thorax. *L. xanthocroum*, Rog. (= *Iridomyrmex xanthocroum* and *I. sericeus*, Mayr), however, seems an oscillating form. Mayr, l. c. p. 960.

Polyergus rufescens. Forel (l. c. p. 306) proves the non-existence of a sting in this species, which had hitherto been considered the sole aculeate member of the *Formicides*. The *Formicidæ* are thus easily sepa-

rated into three subfamilies—the *Formicidæ* (no sting; a single node to the pedicel), *Poneridæ* (a sting; a single node), *Myrmecidæ* (a sting; two nodes).

Gnamptogenys. Mayr, *l. c.* p. 963, tabulates the workers of the species of this genus.

Myrmecia, Fab., is to be classed among the *Poneridæ*, in consequence of Lowne's discovery that its pupæ are enclosed in cocoons. Mayr, *l. c.* p. 968.

Pogonomyrmex. Mayr, *l. c.* p. 970, tabulates the workers of the species of this genus.

Myrmica (*Tetramorium*) *kollari* (Mayr) is recorded from Britain by Smith (Ent. Ann. 1871, p. 60), who protests against Roger's collocation of this species and of his own *M. reticulata* (from Panama) with the African *F. guineensis*, F.

Tetramorium. Mayr, *l. c.* p. 972, tabulates the workers of the species of this genus. *T. tortuosum* and *auropunctatum*, Rog., having only 11-jointed antennæ, must probably be referred to *Pristomyrmex*: Mayr, *ibid.* note. The author (pp. 973-976) discusses *T. cæspitum* (L.), which seems to attain its greatest amount of variation near the Mediterranean, and none of the forms of which, except perhaps *T. meridionale*, Emery, seem to him worthy of a specific rank.

Cremastogaster. Mayr, *l. c.* pp. 989-992, tabulates the workers of the American species of this genus.

FOREL (*l. c.* pp. 308-312) describes the ♂ of *Cremastogaster sordidula*, Nyl., at great length. He notes intermediate variations in its characters, apparently sufficient for specific or even generic distinction, such as four or five joints to max. palpi (the first or fourth joint being sometimes semidivided), two or three joints to lab. palpi (sometimes one semidivided), and convergent lines on the mesonotum present or wanting. From others of the same sex in its genus it appears to differ in its 11-jointed antennæ, of which the third joint is incised, and in having the wing-nervures constantly atrophied.

Eciton mexicana, Rog.: Norton, *l. c.* p. 7, figures major and minor workers of this species.

Pseudomyrma bicolor, Guér.: Norton, *l. c.* p. 8, figures a worker of this species.

Myrmica lyncea, Spin., is a *Pseudomyrma*: Mayr, *l. c.* p. 972.

TOWNSEND (Amer. Ent. & Bot. ii. p. 324, figs. 202 & 203) figures and records the habits of the "Cutting-Ant" of Texas, *Atta ferens*, Say.

Pheidole. Mayr (*l. c.* p. 977) tabulates the males of the Australian, and (pp. 979-982) the males and (pp. 982-984) the workers of the American species of this genus. The worker of *P. oceanica*, Mayr, is now referred by him to *P. umbonata*, one of his new species; and at p. 979 he describes the true worker of *P. oceanica*, from the Friendly Isles. *P. lævigata*, Mayr, = *pallid pusilla*, Heer: Mayr, *l. c.* p. 981, note.

Solenopsis. Mayr, *l. c.* p. 996, tabulates the workers of the species of this genus, except of *S. capensis*, Mayr, of which only ♀ is known. *S. (Diplo-rhoptum) drewseni* (Mayr) = *geminata* (F.), and probably has not its origin from Italy: Mayr, *ibid.* note. *Atta* [*Myrmica*] *gayi* (Spin.) most probably also = *S. geminata* (F.): Mayr, *l. c.* p. 972.

Ecodoma mexicana, Sm.: Norton, *l. c.* p. 9, figures ♀ and major worker of this species.

Cylindromyrmex, g. n., Mayr, *l. c.* p. 967. Facies of *Colydiom* (Col.), and, from the entire hinder plane of the petiole being united with first segment of abdomen, resembling *Amblyopone*, *Mystrium*, *Myopone*, *Prionopelta*, and *Stigmatomma*, but with triangular mandibles. Sp. *C. striatus*, sp. n., Mayr, *ibid.*, Surinam (♀).

Cheliomyrmex, g. n., Mayr, *l. c.* p. 968. Eyeless. Unites the *Ponerides* and *Dorylides*; of the latter, most resembling *Typhlopone* and *Anomma* in structure, but with last abdominal segment entirely conic and without teeth. Its narrow, much curved, and toothed mandibles and bidentate claws distinguish it from *Typhlomyrmex*, *Centromyrmex*, and *Syscia*, genera of *Ponerides* in which the workers are eyeless. Sp. *C. nortoni*, sp. n., Mayr, *l. c.* p. 969, Mexico (worker).

Bothriomyrmex, g. n., Emery, Ann. Mus. Nap. v. p. 117 (no comparative diagnostic characters given). Sp. *B. costæ*, sp. n., Emery, *ibid.* p. 118, Naples and Lecce. The author (Bull. Ent. Ital. ii. pp. 194, 195) recharacterizes this genus, and redescribes both sexes of its species, of which he figures (t. ii. figs. 1 & 3) the wing and head of the ♀, and (f. 6) the head of the ♂. [N.B. The reference at p. 201 is erroneous.]

Leptanilla, g. n., Emery, Bull. Ent. Ital. ii. p. 196. Allied to *Typhlopone*, but differs from all the *Dorylides* hitherto described in the biarticulate petiole of its abdomen. Sp. *L. revelierii*, sp. n., Emery, *ibid.* tav. ii. f. 2 & 7, Corsica (worker).

New species:—

Camponotus. *C.* (Form.) *fulvaceus* (& fig.), *nitidus* and *nacerdus*, p. 2; *C.* (Tapin.) *piceatus* and *tomentosus* (& fig.), p. 3 (all workers), Mexico: Norton, *l. c.*

Camponotus novæ-hollandiæ, Mayr, *l. c.* p. 939, Cape York (worker); *C. vicinus*, Mayr, *l. c.* p. 940, Connecticut, Virginia, New Mexico, California (worker).

Colobopsis. Mayr (*l. c.*) describes the following species:—*C. angustata*, p. 942, *singapore* (♀), *oceanica* (♀), and *carinata* (♂), Fiji Isles, and *nigri-frons* (♀), Friendly Isles, p. 943.

Prenolepis clandestina, Mayr, *l. c.* p. 948, Java (worker); *P. parvula*, Mayr, *ibid.*, N. York (♂, ♀, worker).

Hypoclinea. Mayr, *l. c.*, describes the following species (workers only):—*H. conigera* and *semirugosa*, p. 956, *patens* and *sulcaticeps*, p. 957, Borneo; *plagiata*, *ibid.* and p. 960, N. America (Illinois).

Liometopum apiculatum, Mayr, *l. c.* p. 961, Mexico (worker).

Polyergus lucidus, Mayr, *l. c.* p. 952, Connecticut (♂, ♀, worker).

Polyrhachis australis, Mayr, *l. c.* p. 945, Port Mackay (worker); *P. indica*, Mayr, *ibid.*, Pondicherry (worker); *P. quadricuspis*, Mayr, *l. c.* p. 946, N. S. Wales (worker); *P. arboricola* (fig.) and *P. strigata*, Norton, *l. c.* p. 4, Mexico (workers).

Anochetus graeffei, Mayr, *ibid.*, Upolu (worker).

Platythyrea inconspicua, Mayr, *ibid.*, Ceylon (♀); *P. pruinosa*, p. 962, Mexico (worker).

Ectatomma muticum, Mayr, *ibid.*, Brazil (worker); *E. ferrugineus* [sic], Norton, *l. c.* p. 5, Mexico (worker, figured, and male).

Gnamptogenys concentrica and *regularis*, Mayr, *l. c.* p. 963 (also pp. 964 & 965), Mexico (workers); *G. lineata*, Mayr, *l. c.* pp. 964 & 965, Amazons (worker).

Lobopelta chinensis, Mayr, *l. c.* p. 965, China; *L. kitteli*, p. 966, Sikkim; *L. mexicana*, *ibid.*, Mexico (workers).

Pogonomyrmex angustus, Mayr, *l. c.* p. 970, Chili; *P. opaciceps*, New Mexico, and *P. subdentatus*, California and Connecticut, Mayr, *l. c.* p. 971 (workers).

Leptothorax melanocephalus, Emery, *l. c.* p. 197, Corsica (worker); *L. flavicornis*, Emery, *ibid.*, Portici (worker and ♀).

Tetramorium meridionale, Emery, *l. c.* p. 198, Corsica and Naples (worker and ♀); *T. pacificum* (worker and ♀) and *T. tonganum* (worker), Friendly Isles, and *T. lanuginosum* (worker), Java: Mayr, *l. c.* pp. 972 and 976.

Macromischa rottenbergii, Emery, *l. c.* p. 199, Sicily and Naples (worker and ♀).

Cremastogaster opaca, pp. 989 & 992, Mexico; *coarctata*, pp. 990 & 992, California; *læviscula* and *clara*, pp. 990 & 993, Fort Cobb; *sumichrasti*, *ibid.*, Mexico; *formosa*, *corvina*, and *atra*, pp. 991 & 994, Mexico (all workers); *C. minutissima*, pp. 991 & 995, Texas (worker and ♀): Mayr, *l. c.*

Myrmecia auriventris, Mayr, *l. c.* p. 968, Pt. Mackay and Cape York (worker).

Eciton californicum [sic], Mayr, p. 969, S. Francisco (worker); *E. brunnea* and *E. sumichrasti*, Norton, *l. c.* p. 6, Mexico (workers, the latter figured).

Pachycondila orizabana, Norton, *l. c.* p. 8, Mexico (worker).

Pseudomyrma thoracica, Norton, *ibid.*, Mexico (worker).

Pheidole sexspinosus, p. 977, Ellice Isles (♂ and worker); *umbonata*, *ibid.* and p. 978, Tonga (♂); *inermis* (♂ p. 979, worker p. 982), p. 984, Mexico; *fallax*, pp. 980 & 984, Cuba (♂); *impressa*, pp. 980 & 985, Brazil (♂); *bilimeki*, p. 980 ♂, and p. 985 ♂ and ♀, and *ursus* (♂ p. 980, worker p. 982), p. 986, Mexico; *californica* (♂ p. 981, worker p. 984), p. 987, San Francisco; *striaticeps* (♂ p. 981, worker p. 983), p. 987, and *picea* (♂ p. 981, worker, p. 983), p. 988, Mexico; *bicarinata*, pp. 982 & 989, Illinois (♂): Mayr, *l. c.*

Cryptocerus multispinosus, Norton, *l. c.* p. 9, Mexico (worker, figured).

CHRYSIDIDÆ.

Hedychrum cupreum, Dbm., is renamed *minutum*: Thoms., Op. Ent. ii. p. 105.

CHAPMAN (Tr. Woolh. Cl. 1870, pp. 99-104) records the economy of the species of *Chrysis* parasitic upon *Odynerus spinipes*.

Chrysis osmiæ and *C. brevitarsis*, spp. nn., Thoms. *l. c.* pp. 106 and 107, Sweden; *C. insperata*, sp. n., Chevr. Mitth. schw. ent. Ges. iii. p. 265, Nyon, Switz.

Hedychrum nanum, sp. n., Chevr. *l. c.* p. 266, Switzerland (? an aborted individual, teste auct.).

ICHNEUMONIDÆ.

MARSHALL (Ichn. Brit. Cat.) adds many species to the list of British *Ichneumonida*, and gives much useful synonymy, some of which is original.

COUPER (Canad. Ent. ii. p. 113) makes observations upon the economy of an unknown Ichneumon, of which about 40 specimens were bred by him out of a spider's cocoon found at Montreal.

The larval stages of a parasite (presumed to be an *Ichneumon*) upon a black spider are detailed by Lichtenstein (Ann. Soc. Ent. Er. 4^e sér. x. Bull. p. lxxii).

KAWALL (S. E. Z. xxxi. p. 108) mentions large individuals of *Pimpla examinator* (Grav.) bred from *Hyponomeuta padella*. He also records a curious ♀ specimen of *Xylonomus rufipes* (Grav.); suggests that *Mesostenus niveatus* (Gr.) is the ♂ and *M. pygostolus* (Gr.) the ♀ of the same species; and describes the ♂ of *Rhyssa curvipes* (Gr.), and a queried ♀ var. of *Cryptus abominator* (Gr.).

Ichneumonides.

FASCHENBERG (Z. ges. Naturw. 1870, Bd. ii. pp. 209-272, 369-416, 449-470) tabulates the species of *Ichneumon*, Gr., with linear or linear-elliptic spiracles to the abdomen, consisting of *Chasmodes* (p. 213), *Exophanes* (ibid.), *Ichneumon* (p. 214 et seq.), *Amblyteles* (p. 252 et seq.), *Catadelphus* (p. 265), *Acolobus* and *Hepiopolmus* (p. 266), *Anisobas* and *Listrodromus* (p. 267), *Probolus* and *Eurylabus* (p. 268), *Platylabus* (p. 269 et seq.). Diagnoses of and observations upon the various known spp. of these genera are given (p. 369 to end), and two new species are described, some synonymy (especially of Wesmål's spp.) also being given. *Chasmodes motatatorius* (Gr.) is mentioned as bred from *Caradrina airæ* (p. 369); *C. paludicola* (Wesm.) and *Exephanes occupator* (Grav.) from pupæ of *Nonagria typhæ* (p. 370); *Ichneumon saturatorius*, Gr., from *Calamia phragmitidis* (p. 395); *I. exornatus*, Gr., from *Geometra juniperata* (p. 402); *Amblyteles fasciatorius* (Gr.) from *Brotholomia meticulosa*, and *A. infractorius* (Gr.) from *Agrotis corticea* (p. 414); *A. oratorius* (Gr.) from *Noctua brunnea* (p. 416); *A. unilineatus* (Gr.) from *Nonagria paludicola* (p. 449); *A. culpatorius* (Gr.) from *Melitæa maturna* (p. 450); *A. sputator* (Gr.) from *Plusia gamma* (p. 454); *A. camelinus* (Wesm.) from *Vanessa cardui*, *antiopa*, *io*, *polychloros*, and *Sphinx elpenor* (p. 455); *A. mesocastanus* (Gr.) from *Caradrina cubicularis* (p. 458); *Eurylabus larvatus* (Gr.) from *Harpyia vinula* (p. 463).

HOLMGREN (Eugenies Resa, Insecta, i. pp. 395) describes the males of *Ichneumon lalandei*, St.-F., from C. of Good Hope.

FASCHENBERG (B. E. Z. xiv. p. 425) describes an hermaphrodite example of a new species of *Amblyteles* (cf. Z. ges. Naturw. 1870, Bd. ii. p. 456).

Ichneumon binotatus, Steph. nec Desv., = *leucomelas*, Gm.; *Amblyteles rubriventris* (Wesm.) = *castanopygus* (Steph.): Marshall, l. c. pp. 6 & 8.

Matara, g. n., Holmgren, l. c. p. 395 (no comparative diagnosis given). *Sp. M. nigripennis*, sp. n., Holmgr. *ibid.*, Buenos Ayres and Montevideo, Taf. viii. fig. 1.

New species:—

Ichneumon. Holmgren, l. c., describes the following spp.:—*I. levifrons*, p. 392, *erythrogaster* and *conspersus*, p. 393, *unicinctus*, p. 394, C. of Good Hope; *astutus*, p. 394, California.

Phæogenes melanogaster, Holmgr. l. c. p. 396, Patagonia.

Ischnus melanopygus, Holmgr. l. c. p. 396, C. of Good Hope.

Exrophanes propinquus, Tasch. l. c. p. 371 (no locality given).

Amblyteles hermaphroditus, Taschenb. l. c. p. 426, ♀ Spain (publ. also in Z. ges. Naturw. 1870, Bd. ii. p. 456).

Cryptides.

Cryptus. TSCHKE (Verhandl. zool.-bot. Ges. Wien, xx. p. 111 *et seq.*) refers to the species (5 in number, of which he describes 2 as new) confused under the name of *C. obscurus* (Grav.): *C. sponsor* (Ratz. nec Grav., F.) ♀ = *incisus*, p. 405: ♀ of *C. nubeculatus* (Grav.) is described, p. 408: both sexes of *C. migrator* (Gr.) are described, p. 410, note: the *C. incubitor* of Gravenhorst and of Ratzeburg cannot be referred to the same species, according to the statement of differences at p. 414; *pygoleucus* (Grav.), var. = *incubitor* (Grav.) ♂, and is described p. 415: the females of 15 species are tabulated, p. 425: observations are made at some length (pp. 426-428) upon *C. titillator* (Gr.), resulting in the opinion that the ♂ of that species is identical with the male of *C. analis* (Gr., Tschek), in which case the name *titillator* must attach to the latter insect, and *analis* be altogether dropped, as the ♂ of Gravenhorst's *analis* = *peregrinator* (L.): ♀ of *C. conjungens*, Tschek, is described from Rzeszow, p. 429.

Cryptus. HOLMGREN (l. c. p. 396) recharacterizes this genus as restricted by him.

Cocoons of *Cryptus extrematis*, Cresson (= *nuncius*, Say), a parasite on *Attacus cecropia*, are figured in Amer. Ent. ii. f. 67.

Cryptus junceus, Cresson, is recorded as a parasite on "mud-daubers" (*Agania*, Schdte.), and as having the smell of a *Bombus*: Walsh & Riley, Amer. Ent. i. p. 137, fig. 109.

RITSEMA (Tijdschr. Ent. 1870, p. 120) records having bred a probably undescribed sp. of *Phygadeuon* from the larva of *Enoicyla pusilla*, the terrestrial Phryganidon, upon which it is parasitic.

WALSH (Canad. Ent. ii. p. 10) infers, from various individuals bred by him, that *Pezomachus* is a degraded *Hemiteles*. For observations on the American species of *Hemiteles* by this author, cf. *ibid.* pp. 9-12, 31-33.

Both sexes of *Edemopsis rogenhoferi*, Tschek, are described, from Bautzen and Styria, and the genus is recharacterized: Tschek, l. c. pp. 429, 430.

Ichn. discrepator, Wesm., *ruficollis*, Steph., *erythræus*, Gr., = *Phygadeuon sanguinator* (Gr.); *Hemimachus albipennis*, Ratz., = *avidus* (Först., *Pezom.*); *Crotopus abnormis*, Holmgr., = *Agriotypus armatus*, Curt.: Marshall, l. c. pp. 11-13.

Goryphus, g. n., Holmgr. l. c. p. 398. Characterized at the expense of *Cryptus*, as usually received [on apparently the most trifling grounds]. The author (p. 400) indicates a subgenus *Psacus*, distinguished by its metathorax being rugulose, with three areas rather unevenly sculptured. Sp.: *G. basilaris*, sp. n., p. 398, Taf. viii. fig. 2, and *G. detritus*, sp. n., p. 399 (? = *C. mesoxanthus*, ♀, St.-Farg. teste auct.), China; *G. apicalis*, sp. n., p. 399, Manila; *G. ruficollis*, sp. n., Java, *G. rubripes*, sp. n., Valparaiso, and *G. areolaris*, sp. n., C. of Good Hope, p. 400; *G. virginalis*, sp. n., p. 401, C. of Good Hope.

Listrognathus g. n., Tschek, l. c. p. 153. Mandibles in ♂ very attenuated towards apex; in ♀ curved and dilated beneath from base to middle, and emarginate before apex. Cheeks slightly hollowed at the apex on the lower

side in ♂; in ♀ hollowed and emarginate, widened and deflexed. Fore-head armed above the antennæ with a small sharp horn. Prothorax of ♀ with an obtuse tubercle on each side above, in front of the mesothoracic suture. Sp. *L. cornutus*, sp. n., l. c. p. 154, Austria.

New species:—

Cryptus australis, p. 116, Rhodes; *difficilis*, p. 117, *immitis*, p. 118, *incisus*, pp. 121, 404, 405, *gratiosus*, p. 122, *investigator*, p. 123, *extinctor*, p. 124, *obovatus* and *simplex*, p. 127, *mactator*, p. 128, *inquisitor* and *alutaceus*, p. 129, *mansuetor*, p. 131, *hospes*, p. 133, *fuscipes*, p. 135, *excentricus*, p. 136, *remex*, pp. 137, 416, *vindex* and *heliophilus*, p. 138, *coxator*, pp. 140, 417, *fuscicornis*, p. 140, *explorator*, p. 141, *insector*, pp. 142, 417, *mesocastaneus*, pp. 144, 418, *ambiguus*, pp. 145, 419, *molestus*, p. 146, *abnormis*, pp. 146, 419, *plebeius*, pp. 147, 419, *mimicus*, p. 147, *ingratus*, pp. 148, 422, *tristator*, pp. 148, 423, *neglectus*, p. 149, *simulator*, pp. 149, 423 (Corsica), *pauper*, pp. 150, 424, *castaniventris*, p. 151, *gradarius*, pp. 151, 424, *curvipes*, p. 152 (most of these are presumably from Austria, but the localities are often omitted); *macellus* and *bucculentus*, p. 406, Austria; *erro*, p. 407, Tultscha; *sordidus*, p. 409 (no loc.); *solitarius*, p. 410 (bred from *Zygæna filipendulæ* and *scabiosæ*), and a var. queried as possibly specifically distinct (bred from *Limenitis camilla*); *cimbicis*, p. 412, bred from different genera of *Tenthredinidæ*; *rusticus*, p. 421, Austria: Tschek, l. c.

Cryptus kinbergi, Buenos Ayres, and *C. erythrogaster*, C. of Good Hope, Holmgr. l. c. p. 397.

Mesostemus fugax, Tschek, l. c. p. 152 (Austria).

Ischnocerus (♀) *ferruginosus* and *I. cælebs*, Holmgr. l. c. p. 402, C. of Good Hope.

Hemiteles gastricus, Holmgr. l. c. p. 401, California; *H. nemativorus*, Walsh, indicated in Amer. Ent. ii. p. 18, and described in Canad. Ent. ii. p. 11, Illinois, U. S. A., parasitic upon *Nematus ventricosus*, Klug.

Ophionides.

Ophion macrurum (L.) and its larva are figured in Amer. Ent. ii. figs. 63 & 64; this species is parasitic upon *Attacus cecropia* (L.).

Banchus hastator, Curt., = *moniliatus* (Gr.): Marshall, l. c. p. 16.

New species:—

Ophion volubilis, p. 410, Buenos Ayres; *O. pacificus*, p. 411, C. of Good Hope: Holmgr. l. c.

Paniscus melanocotis, p. 411, Mauritius (♀ = *P. melanopus*, St.-Farg. *teste auct.*); *P. latro*, I. Guam, *semirufus*, R. Janeiro, *capensis*, C. of Good Hope, p. 412: Holmgr. l. c.

Limneria. Holmgrén, l. c., describes the following species:—*L. sinica*, p. 412, China; *spurca*, p. 413, *patruelis*, p. 414, *cinctula*, p. 415, *helmina* and *mollipia*, p. 417, C. of Good Hope; *sidnica*, p. 414, Sydney, *hospita*, California, and *taïtica*, Tahiti, p. 416.

Sagaritis californica, Holmgr. l. c. p. 418, California.

Cremastus pictus, Holmgr. l. c. p. 419, C. of Good Hope.

Thersilochus mæstus, Holmgr. l. c. p. 419, Cape of Good Hope.

Tryphonides.

Megastilus cruentator, Schiödde, = *cruentatus*, Hal.; *Euceros dimidiatus*, Brullé, = *Eumesius albitarsus* (Curt., *Euc*), ♂; *Exenterus colorator*, Holmgr., = *Cteniscus pachysomus* (Steph., *Tryph.*); *Bassus picitans*, Desv., = *obscuripes*, Holmgr.; *B. exultans*, Holmgr., var. 1, = *pulchellus*, Desv. nec Holmgr., and is renamed *desvignesii*; *B. scabrosus*, Desv., = *sundecalli*, Holmgr., ♂: Marshall, l. c. pp. 17-20.

Exochus erythrinus, sp. n., Holmgr. l. c. p. 409, C. of Good Hope.

Bassus cinctipes, p. 409, C. of Good Hope; *B. maculifrons*, p. 410, S. Francisco: spp. nn., Holmgr. l. c..

Pimplides.

HOLMGREN (l. c. p. 404) describes ♂ of *Pimpla vipioides*, Lepel., from C. of Good Hope.

Ephialtes albicinctus, Desv. nec Grav., is renamed *desvignesii*: Marshall, l. c. p. 20.

Echthromorpha, g. n., Holmgren, l. c. p. 406. Differs from its ally *Theronia*, Holmgr. in structure of head, mouth, metathorax, and abdomen, and in the direction of the alar neuration. Sp.: *E. maculipennis*, sp. n., Holmgr. *ibid.*, Honolulu; *E. atrata*, sp. n., Taf. viii. f. 3 (erroneously referred to *E. maculipennis* at p. 406), St. Helena, and *E. mixta*, sp. n., Ascension, Holmgr. l. c. p. 407.

New species:—

Acenitus luteus and *capensis*, Holmgr. l. c. p. 403, C. of Good Hope.

Theronia melanocera, Holmgr. l. c. p. 404, C. of Good Hope.

Pimpla citrina, p. 404, Mauritius; *rubripes*, Cape of Good Hope, and *transgressa*, California, p. 405; *sordidella*, p. 406, Tahiti: Holmgren, l. c.

Lissonota trochanterata, Holmgr. l. c. p. 407, and *L. capensis*, p. 408, C. of Good Hope; *L. xanthopyga*, p. 408, Patagonia.

BRACONIDÆ.

Eurypterna cremieri, Brébisson. Stein (B. E. Z. xiv. p. 426, Taf. iii. f. 8 a-c) notes the affinities and peculiarities of this rare ally of *Pachylomma*.

GRAUD (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. lvii) records *Elasmosoma berolinense*, Ruthe, taken in company with *Formica rufa* at Fontainebleau. He has both sexes, and believes Ruthe not to have described the ♀.

Details of *Bracon dispar*, Koll., are figured by Rondani, Arch. p. Zool. 2nd ser. ii. pl. 1. figs. 9-11.

Dimeris, Ruthe, = *Pambolus*, Hal.: Marshall, Ent. M. M. vi. p. 228.

Glyptomorpha, g. n., Holmgren, l. c. p. 427. Facies of *Glypta*; maxillæ produced, antennæ short, thorax punctured, abd. rugulose-punctate, last ventral segm. entirely covering base of terebra. Sp. *G. ferruginea*, sp. n., Holmgr. *ibid.* Taf. viii. f. 4, S. Africa.

Saproctichus, g. n., Holmgr. l. c. p. 430 (no comparative diagnostic charac-

ters given). Sp.: *S. chinensis*, sp. n., Holmgr. *ibid.* Taf. viii. f. 5, China; *S. vitticollis*, sp. n., Holmgr. l. c. p. 431, California.

New species:—

Bracon dimidiatus, Malacca, and *melanocephalus*, Puna, p. 420; *sanguinosus*, p. 421, Mauritius; *taiticus* and *unicarinatus*, p. 422, Tahiti; *maculiventris*, p. 423, *pectoralis*, p. 424, *victorini*, p. 426, C. of Good Hope; *bohemani*, p. 423, *melanopus*, p. 424, *wahlbergi*, p. 425, S. Africa; (*B.?*) *ferruginosus*, p. 426, Rio Janeiro: Holmgren, l. c.

Bracon bellosus, Smith, Tr. E. Soc. 1870, p. 531, Kinsembo, S.W. Africa.

Agathis chinensis, China, and *cozatus*, Puna: Holmgr. l. c. p. 428.

Ischius leucogaster, Holmgr. l. c. p. 429, Sydney.

Perilitus longipes, Holmgr. l. c. p. 429, Tahiti.

Microtonus rufus, Holmgr. l. c. p. 431, Buenos Ayres.

Microgaster guamensis, I. Guam, and *taiticus*, Tahiti, p. 432; *carbonarius*, Mauritius: Holmgr. l. c. p. 433.

Chelonus hispinus, p. 433, Puna; *C. fraterculus*, p. 434, Tahiti: Holmgr. l. c.

Pambolus melanocephalus, Mshall. l. c., Surrey and Kent.

EVANIIDÆ.

Feonus [sic] *arca*, sp. n., Couper, Canad. Ent. ii. p. 110, Ottawa.

CHALCIDIDÆ.

Isosoma hordei (Harris). Walsh & Riley (Amer. Ent. i. pp. 149–158) discuss the economy of this species, known as the "Joint-worm" in North America, and figure it and stems of barley affected by it, figs. 113 & 117.

Chalcideous parasites of this insect are well figured (f. 114), and named *Semiotellus chalcidiphagus*, but not described, and other real or supposed spp. of "joint-worms" are discussed. The authors argue, from unity of habit, that *hordei* (Harr.) is not a *Eurytoma*, which is a parasitic genus, although it undoubtedly belongs to the *Eurytomides*; and they give figures and details of both sexes of *Eurytoma* and *Decatoma*, showing differences of structure, as compared with *Isosoma*, in corroboration of this argument. A new genus, *Antigaster*, containing one new species, *A. mirabilis*, is indicated at p. 156, and figured in detail, f. 118. This, with the new species above mentioned, is subsequently described in a posthumous paper by Walsh.

WALSH (in the posthumous paper above alluded to, published in Amer. Ent. & Bot. ii. pp. 297–301, 329–335, 367–370, figs. 1–10), after some observations (founded on the habits of certain spp. of *Eurytoma* and *Chalcis*) tending to express a belief in the existence of Entomophagic varieties and species analogous to his expressed views as to Phytophagic vars. and spp., recharacterizes the genera *Eurytoma*, *Decatoma*, and *Isosoma*. He tabulates the N. American spp. of *Eurytoma* (p. 298), and describes the following new species and vars.:—*E. bicolor*, *ibid.*, from fungoid growth on twigs of black and red oak (*cf.* Osten-Sacken, Proc. Ent. Soc. Phil. iv. p. 365, note), but probably an inquiline only; *E. prunicola*, *ibid.* fig. 1, from the gall *Quercus prunus* Walsh, and var. *globulicola*, p. 299, from gall *Q. globulus*, Fitch; *E. auriceps*, *ibid.*, from galls *Q. erinaceus*, Walsh, ? = *Q. pisum*, Fitch, *Q. spongifica*, O.-S., *Q. hirta* (Bass.), and *Q. radicum*, O.-S., and var. *seminatrix* from

gall *Q. seminator*, Harr.; *E. punctiventris*, *ibid.*, from gall *Q. mamma*, Walsh; *E. abnormicornis*, *ibid.*, ♀, taken at large; *E. diastrophii*, *ibid.*, from bramble-gall of *Diastrophus nebulosus*, O.-S. [var. *bolteri*, Riley, from lepidopterous gall of *Gelechia galle-solidaginis*, Riley, recharacterized]; *E. gigantea*, p. 300, ♀ taken at large. *E. studiosa* (Say) is recorded (p. 299) as being bred from four different Cynipidous oak-galls, from five different Tenthredinous willow-galls, from six different Cecidomyidous galls on willow, goldenrod, and ironweed, from Aphidian and Coccidous leaf-galls on shell-bark hickory, and from fungoid growth on pignut hickory. These are all stated not to differ from Say's species; but slight colour vars. have been also bred from two other oak-galls. The N. American spp. of *Decatoma* are tabulated (p. 300), and the following new spp. and vars. described:—*D. varians*, *ibid.* f. 2, from oak-galls *Q. podagræ*, Walsh, *Q. spongifica*, *Q. inanis*, and *Q. palustris*, O.-S., and var. *dubia* from *Q. mamma*, Walsh; *D. nigriceps*, *ibid.*, from oak-gall *Q. ficus*, Fitch, and var. *excrucians*, p. 301, from gall *Q. seminator*, Harr.; *D. hyalipennis*, *ibid.*, ♂ and ♀ taken at large; *D. simplicistigma*, *ibid.*, from Cynipidous oak-galls, *Q. erinaceus*, Walsh, *Q. petiolicola*, Bass., and *Q. ficus*, Fitch; *D. nubilistigma*, *ibid.*, from Cecidomyidous willow-gall *S. batatas*, Walsh, and an undescribed gall on swamp white oak. *Isosoma hordei* (Harr.) is again discussed (pp. 329, 330) and figured (figs. 3 & 4), with details, and a long and interesting digression upon dimorphism in *Cynips* is made, as bearing upon the author's proposition that many insects, absolutely undistinguishable externally, yet of widely different habits, may be taken as differing widely *internally*, and therefore as being specifically distinct. On the other hand, the author admits that many dimorphous forms of the same species are probably now erroneously considered to be distinct. The author proceeds to recharacterize (p. 367) *Semiotellus*, Westw., so as to properly include in it a new species which he had hitherto referred to *Glyphe*. This is *S. chalcidephagus*, sp. n., p. 368, f. 7, parasitic upon *Isosoma hordei* (larva also described). Finally, Walsh describes a new genus of *Encyrtides*, viz. *Antigaster*, p. 368, in which the body is capable of rolling up in the contrary way to that of *Chrysis*. Sp. *A. mirabilis*, sp. n., Walsh, l. c. p. 369, f. 9 ♀, Rock Island, Illinois. The ♂, bred from eggs of *Phylloptera oblongifolia*, is described by Riley, *ibid.*, and figured with its pupa &c. f. 10.

MÜLLER (Ent. M. M. vii. p. 60) notes the abundance of pupæ of the ♀ of *Callimome devoniensis*, Pftt., in small galls of *Cynips lignicola*, Htg.

Blephonira, g. n., Holmgren, Eugenesi Resa, Ins. i. p. 498 (no comparative diagnosis given). *B. fulvipes*, sp. n., Holmgr. *ibid.* Taf. viii. f. 6, China.

Oomyzus, g. n., Rondani, Nota &c. p. 5. Sp. *O. galleruæ* (Fonscol., Pterom.), parasitic upon eggs of *Galleruca xanthomelena*.

New species:—

Chalcis maculata, p. 434, *variegata* and *pallida*, p. 435, I. Puna; *subfasciata*, p. 436, Buenos Ayres: Holmgren, l. c.

Chalcis maria, Riley, Amer. Ent. ii. p. 101, note, fig. 66, bred from *Attacus polyphemus* and *A. promethea*, Kentucky.

Chalcis (Aphelinus) mytilaspidis, Le Baron, Amer. Ent. & Bot. ii. p. 360, note, f. 220, parasitic upon the "Apple-tree Bark-louse." A full account of its economy is given *ibid.* pp. 360–362.

Hookeria argentigera, Holmgr. l. c. p. 436, Java.

Brachymeria pulchripes, Holmgr. l. c. p. 436, Manilla; *B. sidnica*, Sydney, and *B. panamensis*, Panama, p. 437: Holmgr. l. c.

Haltichella nasuta, Holmgr. l. c. p. 437, Manilla; *H. validicornis*, Holmgr. l. c. p. 438, Java.

Pteromalus contractus, Holmgr. l. c. p. 438, I. Puna.

Calimome dorycnicola, Müller, Ent. M. M. vii, p. 77, Mentone (parasitic on the author's *Cecidomyia dorycnii*).

Leucopsis lepida, Chev. Mitth. schw. ent. Ges. iii. p. 274, Switzerland.

Misina nemorance, Rondani, Archiv. p. Zool. 2nd ser. ii. pp. 12 & 15, tav. i. figs. 1-4, Italy, parasitic on *Xylopoda nemorana*.

Anaphes ovivorus, Rond. l. c. pp. 13 & 16, tav. i. figs. 5-8, Italy, parasitic on *Porthesia chrysorrhæa*.

In Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. v, is a brief description of a new sp. of *Allocera*, from Oran, under the name of *unicolor*, 7 or 8 lines of diagnostic characters being incidentally mentioned in the report of a paper by Lucas on the parasitism of *Allocera*, of which merely the title is given, with the evident intention of insuring priority before publication of the paper.

PROCTOTRYPIDÆ.

Proctotrypes californicus, sp. n., Holmgren, l. c. p. 434, California.

CYNIPIDÆ.

VON SCHLECHTENDAL (S. E. Z. xxxi. pp. 338-347, 376-396) gives particulars of the economy (especially with reference to the galls) of the following spp. :—*Cynips calicis*, Bgsdff., *lignicola* and *kollari*, Htg., *gemmæ*, L., *collaris* and *corticalis*, Htg., *corticis*, L., *radicis*, F., *autumnalis*, *callidroma*, *glandule*, *globuli*, *ferruginea*, *folii*, *longiventris*, *agama*, and *disticha*, Htg.; *Andricus trilineatus*, *inflator*, *curvator*, and *testaceipes*, Htg., *burgundus*, Gir.; *Neuroterus malpighii*, *fumipennis*, *reumuri*, and *ostreus*, Htg.; *Teras terminalis* (F.); *Biorhiza aptera* (F.) and *renum*, Htg.; *Spathogaster baccarum* (L.), *tricolor*, Htg., *aprilinus*, Gir., *albipes*, Schk.; *Trigonaspis crustalis*, Htg.; *Rhodites rosæ* (L.), *eglanterizæ*, Htg., *spinosissimæ*, Gir.; *Diastrophus rubi*, Htg. The author also enumerates 9 species of *Cynips*, of which he is only acquainted with the galls; 6 of these he describes as new, under the names *C. ramicola*, p. 395, *inflorescentiæ* and *tegmentorum*, p. 396, *fasciata*, *marginalis*, and *vesicatrix*, p. 397.

PUTON (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xxxviii) raises the question whether the galls formed by *Cynips* are injurious to vegetation, such having been the case in an instance mentioned by him.

MARSHALL (Ent. M. M. vi. pp. 178-181) tabulates and briefly refers to the British genera of the Inquiline, Aphidivorous, and Parasitic sections of this family, of which he enumerates 16.

MÜLLER (Ent. M. M. vii. p. 108) records *Cynips longiventris*, Htg., from Britain.

SMITH (Ent. Ann. 1871, pp. 61-63) records his observations upon 4410 galls of *Cynips lignicola*, in the unrealized hope of detecting the ♂ of that species.

WESTWOOD (Pr. E. Soc. 1870, p. ii) notes one of the *Cynipidæ* from the

Sula Islands, possessing membranaceous dilatations on the neck, basal joint of antennæ, femora, and tibiæ.

For an account of a large brood of *Cynips ramuli*, cf. Pr. E. Soc. 1870, p. xxx.

MÜLLER (Pr. E. Soc. 1870, p. xxxiv) refers to the economy of *Cynips renum* and *C. agama*.

WALSH and RILEY (Amer. Ent. i.), in a general article on American gall-producing insects and their parasites, describe the economy and figure the galls of *C. quercus spongifica* (O.-S.), p. 103, fig. 78; *C. quercus inanis* (O.-S.), p. 104, fig. 79; *C. quercus prunus* (gall only described by Walsh, Proc. Ent. Soc. Phil. iii.), sp. n. They also name *quercus mamma* (p. 101, note) a gall resembling *Q. globulus*, Fitch, and referred to it by Walsh, *l. c.*, but now discovered to be produced by a different sp. from the insect causing that gall. After Walsh's death, Riley continues (*l. c.* ii.) the articles on American galls, but attributes the Hymenopterous portion exclusively to Walsh. He describes the economy and figures the gall of *C. q. seminator*, Harris, p. 71, fig. 45; describes and figures (with doubt) the gall *Quercus frondosa*, Bassett, p. 72, fig. 46; and a new gall, *Lygodesmia pisum*, p. 73, fig. 47, on the insect producing which a new genus is founded, p. 74.

MÜLLER (Ent. M. M. vii. p. 38) records some observations on the dimorphism of American *Cynipidæ*.

An odour, similar to that of ants or bees, exhaled by an American subapterous sp. of *Cynipidæ*, is mentioned by Müller, Pr. E. Soc. 1870, p. xvi. Müller also notes odours exhaled by *Cynipidæ* in Zool. s. s. p. 2027.

Andricus curvator, Htg. Müller (*l. c.* p. 39) describes the gall of this species from British examples; and (p. 157) also describes the economy of *A. inflator*, Htg., from British examples.

MÜLLER (Zool. s. s. p. 2303) records an instance of unusual oviposition by *Rhodites rosæ* (L.).

Bedeguars caused in N. America by *Rhodites rosæ* (L.) are described and figured by Riley, Amer. Ent. & Bot. ii. p. 213, f. 130.

Prickly galls on wild rose, caused by *Rhodites bicolor* (Harr.), are described and figured in Amer. Ent. & Bot. ii. p. 309, f. 192.

Galls on raspberry-roots caused by *Rhodites radicum*, O.-S., are described and figured (f. 110) by Riley, *l. c.* p. 181.

Galls on blackberry-canes caused by *Diastrophus nebulosus*, O.-S., are described and figured (f. 103) by Riley in Amer. Ent. ii. p. 159.

Antistrophus, g. n., Walsh, Am. Ent. ii. p. 74. Third joint of ant. much shorter than 4th; both transverse veins of front wings as slender as other veins, almost colourless, and with no cloudy margin; radial area elongate, areolet obsolete. Sp. *A. lygodesmia pisum*, sp. n., Walsh, *ibid.*, gall figured at p. 73, Nebraska, U. S. A., infests *Lygodesmia* (*Compositæ*); ? also a *Diastrophus* from *Centaurea*, reared by Giraud (Verh. z.-b. Wien, 1859).

New species:—

Cynips corruptrix, v. Schlecht. *l. c.* p. 339, Freiberg (oak); *C. albopunctata*, v. Schl. *l. c.* p. 376, Halle (*Q. pedunculata*); *C. quercus mamma*, Walsh & Riley, *l. c.* p. 102, note, N. America, on burr-oak; *C. quercus prunus*, W. & R. *l. c.* p. 104, figs. 80 & 81, N. America, black and red oak.

Andricus circulans, Mayr, Mitt. eur. Eichgallen, 1870, erste Hälfte.

Neuroterus pezizæformis, v. Schl. l. c. p. 384, Halle (oak).

Spathegaster verrucosus, v. Schl. l. c. p. 380, Halle (oak); *S. taschenbergi*, v. Schl. l. c. p. 391, Halle (oak).

Diastrophus radicum, Bassett, Canad. Ent. ii. p. 98, galls from roots of *Rubus villosus*; *D. turdus* [sic], Bassett, l. c. p. 99, galls from roots of *R. strigosus*, Connecticut, U. S. A.

TENTHREDINIDÆ.

BALLION (Bull. Mosc. xlii. pp. 445-448) gives a list of spp. of *Tenthredinidæ* described by Eversmann and Klug, and omitted from Kirchner's Cat. Hymenopt. Europæ.

PULS (Ann. E. Belg. xiii. pp. 147-152) gives a list of the *Tenthredinidæ* taken by Deyrolle in the Caucasus. He describes the ♂ of *Abia dorsalis*, Costa, a var. of ♀ of *Allantus luteocinctus*, and 9 vars. of *A. köhleri*, Kl.

In protocol of 47th meeting of Soc. Imp. des Amat. des Sc. Nat. &c. Moscow, January 1870, pp. 213-225, is a description by Freymuth of *Tenthredinidæ* collected by Fedtschenko in the valley of Zaravschan, including a new genus and 7 new spp., and varieties of *Tenthredo viridis*, L., *Allantus consobrinus* and *A. dispar*, Kl., *Dolerus gonager* (F.), and *D. vestigialis*, Kl.

NEWMAN (Ent. 80 & 81, p. 148) describes the larva of an unknown saw-fly which feeds inside the stem of the lady-fern, causing a quantity of froth to exude through lateral apertures.

For observations on the "Pear-tree slug" (larva of a saw-fly), see Saunders, Canad. Ent. ii. pp. 148 & 149.

BELLEVOYE (Ann. Soc. Ent. Fr. 4^e sér. x. Bull. p. xxxvi) mentions several *Tenthredinidæ* as proceeding from cocoons inclosed in species of *Helix*. He infers that their presence in such a habitation is only due to the accommodation afforded by the cavity of the shell.

MORAWITZ (Hor. Ent. Ross. vii. Bull. p. xviii) records a *Tenthredo* with its right antenna bifurcated at the 3rd joint, from which a triarticulate supplementary branch proceeded.

A neural aberration in anterior wing of *Selandria socia*, Kl., is described by Ritsema, and figured, Tijdschr. Ent. 2nd ser. v. p. 182.

VAN VOLLENHOVEN (Tijdschr. Ent. 2nd ser. v. pl. 1. figs. 1-8) figures different stages of *Nematus appendiculatus*, Hart.; *Emphytus serotinus*, Kl., pl. 2; *Cimbex femorata* (L.), pl. 3; and some of the earlier stages of *C. lucorum* and *sylvarum*, *Lophyrus pini*, and ? *Nematus ventricosus*, pl. 4; all which spp., with *Nematus vallator* and *N. septentrionalis*, he discusses at some length, l. c. pp. 56-74.

Abia sericea is noted by Lock as feeding on *Scabiosa succisa*: Ent. 73, p. 20.

Nematus pedunculi, Htg. Müller, Ent. M. M. vi. p. 184, gives details of the economy of this sp.

WALSH and RILEY (Amer. Ent. ii. pp. 45-50), in a general article on N.-American galls and their architects, describe the economy, and figure the larvæ and galls of Walsh's *Nematus salicis pomum* (f. 30), *Euura salicis ovum* (f. 31) and *E. salicis gemma* (f. 32). Saws of the former sp. are also figured in Amer. Ent. ii. p. 19, f. 10.

SAUNDERS (Canad. Ent. ii. pp. 13-17) records his notes and experiments upon the larvæ of *Nematus ventricosus*, Klug, in Ontario. For further ob-

servations by this author on the same species, with figures, see *ibid.* pp. 146, 147. The larva and both sexes of this species, known in N. America as "the imported Currant-worm," are figured in Amer. Ent. ii. p. 16, figs. 7 & 8, where descriptions are given of the chief stages of the insect and its economy. "The native currant-worm," *Pristiphora grossulariæ*, Walsh, is in like manner described and figured, p. 20 *et seq.*, f. 11.

Phyllotoma amaura (Kl.) = *vagans* (Fall.): Thomson, *l. c.* 269.

Fenella monilicornis (Dbm.) = *minuta*, ♂, Dbm.: Thomson, *l. c.* p. 270.

Selandria puella (Fall.) = *flavescens* (Kl.): Thomson, *l. c.* p. 291.

For observations on the ravages of *Blennocampa cerasi* in Shropshire, *cf.* Pr. E. Soc. 1870, p. xxxv.

Blennocampa luteiventris (Kl.) = *fuscipennis* (Fall.); *B. nigerrima* (Kl.) = *nigrita* (F.); *B. longicornis* (Htg.) = *geniculata* (Htg.); *B. hyalina* (Kl.) = *asimilis* (Fall.); *B. cerasi* (Kl.) = *æthiops* (F.): Thomson, *l. c.* p. 280 *et seq.*

Hoplocampa brunnea (Kl.) = *ferruginea* (Pz.): Thomson, *l. c.* p. 277.

Macrophya crassula (Kl.) = *albipuncta* (Fall.); *M. rufipes* (Fall.) = *strigosa* (F.): Thoms. *l. c.* p. 295.

Taxonus nitidus (Kl.) = *agrorum* (Fall.); *T. bicolor* (Kl.), *bizonata* (Zett.) = *pratensis* (Fall.); *T. agilis* (Kl.) = *glabratus* (Fall.): Thomson, *l. c.* p. 290.

Strongylogaster eborinus (Kl.) = *delicatulus* (Fall.): Thoms. *l. c.* p. 293.

Pæcilostoma obesa (Kl.) = *pulverata* (Fall.); *P. repanda* (Kl.) = *candidata* (Fall.); *P. impressa* (Kl.) = *guttata* (Fall.): Thomson, *l. c.* p. 288.

Synairema rubi (Panz.). Of this sp. *Tenthredo lividiventris*, Fall., and *S. delicatula*, Htg., are the ♀; *T. elegantula*, Fall., and *Perineura rubi*, Htg., are the ♂: Thoms. *l. c.* p. 300.

Perineura aucupariæ (Kl.) = *gibbosa* (Fall.): Thoms. *l. c.* p. 302.

Tenthredo fagi, Kl., = *livida*, L.: Thoms. *l. c.* p. 303.

Tenthredo luteicornis, F., Panz. (= *flavicornis*, Lep. nec F.) = *flavicornis*, F., Pz., Hart., Tasch. (= *luteicornis*, Ev. nec F.), ♀; *T. flavicornis*, Ev., is renamed *eversmanni*, and redescribed: Ballion, Bull. Mosc. xlii. p. 444.

Emphytus maculatus, Nort. The different stages of this sp. are described and figured in Amer. Ent. i. p. 90, fig. 76.

Emphytus perta (Kl.) ? = *bohemani* (Dbm.); *E. patellata* (Kl.) = *tener* (F.): Thomson, *l. c.* p. 275.

MAY (Zool. s. s. pp. 1993) continues his translation of Van Vollenhoven's descriptions under the title "Life-histories of Saw-flies." *Emphytus cinctus* (L.) is the only species treated of in 1870 in this publication.

GIRAUD (Ann. Soc. Ent. Fr. 4^e sér. x. pp. 27-30) gives short characters for *Janus* (Steph.), and an account of the economy of *J. femoratus*, Curt., and its allies. He has bred that sp. from sytellings in lower branches of young trees of *Quercus pedunculatus* at Fontainebleau and Vincennes, and notes that its parasite is *Ephialtes inanis* (Gr.). *Ephippionotus luteiventris*, Costa, ♂ = *Cephus compressus* (F.), which is also a *Janus*, and attacks pear-trees; whereas the other two spp. of *Cephus* (*pygmaeus*, L., and *arundinis*, Gir.) live in the stems of *Graminaceæ*. The author considers this difference of habit to substantiate the generic differences.

New genera :—

Canoneura, Thomson, *l. c.* p. 270. Similar to *Phyllotoma* in its mandibles, 1870. [VOL. VII.]

palpi, and legs (and nearly in its wings also), but with 8-jointed antennæ. Sp. *C. dahlbomi*, sp. n., Thoms. *l. c.* p. 271, Sweden.

Eniscia, Thomson, *l. c.* p. 299. Allied to *Allantus*, but with the eyes not reaching the base of mandibles, and not at all (or scarcely) converging, the inner orbit not being situate within the base of mandibles. Sp. *E. consobrina* (Kl.); *E. arctica*, sp. n., p. 300, Lapland.

Pompholyx, Freymuth, *l. c.* Remarkable for the ♀ being apterous, with an enormous development of the proscutum. The nervures of the wings in the ♂ show its affinity to *Monophadnus*. Sp. *P. dimorpha*, Freym. *ibid.*, Zaravshan.

New species:—

Hylotoma bonariensis, Holmgren, Eugénies Resa, *Insecta*, i. p. 391, Buenos Ayres; *H. atripes*, Holmgr. *ibid.*, Rio Janeiro.

Schizocera pilicornis, Holmgr. *l. c.*, Brazil.

Nematus solea, v. Vollenh. *l. c.* p. 59, pl. 1. figs. *a-e*, Holland.

Phyllotoma melitta, Newman, *Ent.* 73, p. 1 (presumably Britain). HEALY (*ibid.* pp. 2-7) gives particulars of the economy of this sp. M'LACHLAN (*Ent. M. M.* vi. p. 213) corrects numerous errors in Newman's description, and shows that the sp. = *Fenusa betulae*, Zaddach (1859).

Athalia glabricollis, Thoms. *l. c.* p. 268, Sweden.

Selandria annulitarsis and *S. foveifrons*, Thoms. *l. c.* 292, Sweden.

Blennocampa lanceolata, Thoms. *l. c.* p. 283, and *B. subserrata*, Thoms. *l. c.* p. 285, Sweden.

Eriocampa marginata, Puls, *l. c.* p. 148, Gori, Souram.

Allantus pallipes, Freymuth, *l. c.*, Zaravshan.

Perineura brevispina, *P. excisa*, and *P. auriculata*, Thoms. *l. c.* p. 301, Sweden.

Tenthredo albopicta, Persathi, and *T. purpurea* (no loc. given), Puls, *l. c.* p. 151; *T. nigratarsis*, Puls, *l. c.* p. 152, Persathi.

Dolerus rugosus (and 2 vars.), *D. lucidus*, and *D. similis*, Freymuth, *l. c.*, Zaravshan.

Tarpa skorniakovii and *T. nitens*, Freymuth, *l. c.*, Zaravshan.

LEPIDOPTERA

By W. F. KIRBY, M.E.S. &c.

LIST OF PUBLICATIONS.

ANKER, L. Ein neues Microlepidopteron aus Ungarn. *S. E. Z.* 1870, pp. 143, 144.

BARRETT, C. G. On the larva of an unknown Lepidopterous Insect, found in the Barley-crop of 1868. *Tr. Norw. Soc.* 1869-70, pp. 27-29.

——. Two days' collecting at Ranworth. *Ent. M. M.* vi. pp. 275-277.

BERCE, E. Faune Entomologique Française. Lépidoptères. 3^{me} volume. Hétérocères. Noctuæ. Première Partie. Paris: 1870, pp. vii, 256, pls. 34–38, and one plate of details.

Contains the Noctuæ, according to Guénée's arrangement, as far as the genus *Mesogona*.

BIENERT, T. Lepidopterologische Ergebnisse einer Reise in Persien in den Jahren 1858 und 1859. 8vo. Leipzig: 1870, pp. 56.

This pamphlet is divided into three parts: the first contains an account of Herr Bienert's journey, in company with a Russian expedition, from the Caspian Sea to Beloochistan, and contains notes on the geology, botany, and entomology of the country; the second contains notes on the *Lepidoptera* captured during the expedition, with descriptions of some new species; and the third is devoted to a tabular comparison of the geographical distribution of known Persian *Lepidoptera*, 380 in number, in the neighbouring countries.

BOISDUVAL, J. A. Considérations sur des Lépidoptères envoyés du Guatemala à M. de l'Orza. 8vo. Rennes: 1870, pp. 100.

This work is disfigured by the large number of manuscript and misapplied generic names which it contains, to say nothing of innumerable misspelt names. Many species described by previous authors are reproduced here as new, without reference to their works. Such genera as are characterized appear to be founded, for the most part, on extremely insufficient characters.

BUCKLER, W. Description of the larva of *Deilephila galii*, with notes on its variation. Ent. M. M. vii. pp. 123–127.

BURGESS, E. *Vide* SCUDDER, S. H.

BURMEISTER, H. Ueber die Gattung *Euryades* Felder's. S. E. Z. 1870, pp. 414–421.

BUTLER, A. G. Catalogue of Diurnal *Lepidoptera* described by Fabricius in the Collection of the British Museum. Printed by order of the Trustees. 8vo. London: 1869, pp. iv, 303, pls. 3.

——. *Lepidoptera Exotica*. Parts 3–6. Jan. to Oct. 1870. London: 4to, pp. 17–50, pls. 7–19.

——. Descriptions of Exotic *Lepidoptera* from the Collection of Herbert Druce, Esq. Cist. Ent. pt. 2, pp. 17–32.

——. A revision of the genera of the subfamily *Pierinæ*. L. c. pt. 3, pp. 33–58, 4 plates of neuration.

——. Descriptions of six new species of *Callidryas*. Tr. E. Soc. 1870, pp. 9–12.

——. Notes on the species of *Charaxes* described in the 'Reise der Novara,' with descriptions of two new species. L. c. pp. 119–122, coloured plate.

BUTLER, A. G. On Butterflies recently received by Mr. Swanzy from West Africa. *L. c.* pp. 123, 124.

——. Descriptions of some new Diurnal *Lepidoptera*, chiefly *Hesperiidæ*. *L. c.* pp. 485-520.

——. On new or recently described species of Diurnal *Lepidoptera*. *Ent. M. M.* vi. pp. 250-252, pl. 1.

——. The Genera of *Hesperiidæ* in the Collection of the British Museum. *Ibid.* vii. pp. 55-58, 92-99.

——. List of Diurnal *Lepidoptera* collected by Mr. Spaight in Northern India. *P. Z. S.* 1870, pp. 724-728.

Contains no new species.

——. Note on abnormalities in the neuration of the hind wings in *Acræa andromacha*. *Ibid.* pp. 777, 778.

CURIO, A. Della partenogenesi fra i Lepidotteri. *Atti Soc. Ital.* xiii. pp. 27-32.

Parthenogenesis in *Lepidoptera* may be normal or accidental. Some supposed cases may have originated in erroneous observations. Further observations on the subject are very desirable, and might conveniently be made on the various species of silkworms.

DIETZE, C. Beschreibung der Raupe von *Eupithecia irriguata*, Hübn. *S. E. Z.* 1870, pp. 336, 337.

DOHRN, C. A. Zusatz zu dem über *Paraponyx stratiotata* aus dem Treitschke'schen Auszuge Mitgetheilten. *S. E. Z.* 1870, pp. 223, 224.

DUBOIS. Les Lépidoptères de la Belgique, leurs chenilles et leurs chrysalides, &c. 8vo, col. plates. Bruxelles.

Noticed *R. Z.* 1870, p. 151. Part 42 is there stated to have appeared in 1869.

EDWARDS, W. H. The Butterflies of North America, with coloured drawings and descriptions. Parts V. & VI. Philadelphia: 4to, Dec. 1869, June 1870.

The appended synopsis extends to the genus *Argynnis*.

——. Notes on *Grapta c-aureum* and *interrogationis*, Fab. *Tr. Am. Ent. Soc.* iii. pp. 1-9.

——. Descriptions of new species of Diurnal *Lepidoptera* found within the United States. *Ibid.* pp. 10-22.

ERSCHOFF, N., & FEILD, H. F. Catalogus *Lepidopterorum Imperii Rossici*. 8vo. St. Petersburg: 1870, pp. 77.

1866 Macro- and 1314 Microlepidoptera are enumerated. The appendix contains a few new species with Latin diagnoses, and critical remarks in Russian on these and various other species.

FARN, A. B. Silk-culture in Japan. Ent. v. pp. 87-91.

Compiled, with additional notes, from an official report by Mr. Adams, Secretary to H.M. Legation in Japan, on the Central Silk Districts of Japan.

FUCHS, A. Verzeichniss der Grossschmetterlinge welche in der Gegend von Oberursel vorkommen. Ein Nachtrag zu dem Verzeichnisse der Schmetterlinge Nassau's von Dr. A. Rössler. JB. Ver. Nass. 1867-1868 (xxi., xxii.), pp. 203-260.

544 species enumerated. A specimen of a register for making local lists or species is given. Notes on times of appearance, localities, &c. accompany each species.

——. Zur Naturgeschichte von *Acidalia contiguaria*, Hb. Ibid. pp. 261-263.

GANIN, —. Ueber die Embryonalhülle der Hymenopteren- und Lepidopteren-Embryonen. Mém. Péters. xiv. no. 5, pp. 18, plate.

Contains notes on the development of the embryo of *Bombyx mori* in the egg, with references to the embryos of *Pieris brassicae* and *Bombyx pini*. The first 13 pages, however, are devoted to the embryology of ants.

GÄRTNER, A. Ueber die Artrechte und die ersten Stände der *Coleophora albifuscella*, Zell., und *C. leucapennella*, Hübner. Verh. Ver. Brünn, vii. pp. 174-180.

GRAAF, H. W. DE, & SNELLEN, P. C. T. Microlepidoptera, nieuw voor de Fauna van Nederland. Tijdschr. Ent. (2), v. pp. 218-226.

GREGSON, C. S. Varieties and Aberrations of *Lepidoptera*.—*Geometrae*. Ent. v. pp. 70-76.

GRENTZENBERG, R. Die Makrolepidopteren der Provinz Preussen. Schr. Ges. Königsb. x. pp. 89-122.

809 species are enumerated as occurring in Prussia proper, out of 1501 German species. The present paper contains only *Noctuae* and *Geometrae*, the preceding groups having formerly been catalogued by H. Schmidt.

GROTE, A. R. On *Thecla inorata*, G. & R., and *Thecla falacer*, Godt. Canad. Ent. ii. pp. 165-168.

——. On the structural characters of *Polyommatus tarquinius*. Tr. Am. Ent. Soc. ii. pp. 307, 308.

——. On a new genus of *Noctuidæ* allied to *Dyops*, with remarks on certain species of *Agrotis*. Ibid. pp. 308, 309.

——, & ROBINSON, C. T. On the American Butterflies referred to the genus *Charis* by Doubleday. Ibid. pp. 310, 311.

GUÉNÉE, A. Notice sur l'*Æcocecis guyonella*, Gu., et sur la

Galle qu'elle produit. Ann. Soc. Ent. Fr. (4) x. pp. 5-16.

GUÉNÉE, A. Rapport sur l'excursion entomologique faite dans les montagnes de l'Ardèche et en particulier à Celles-les-Bains de Mai à Juillet 1869. Ibid. pp. 17-26.

Chiefly devoted to notices of the Lepidoptera observed, but contains very little of importance.

HEINEMANN, H. v. Die Schmetterlinge Deutschlands und der Schweiz systematisch bearbeitet. Nebst analytischen Tabellen zum Bestimmen der Schmetterlinge. Zweite Abtheilung. Kleinschmetterlinge. Band ii. Die Motten und Federmotten. Heft 1, 8vo. Braunschweig, 1870, pp. 388.

The present instalment of Von Heinemann's great work on the Lepidoptera of Germany and Switzerland contains the *Choreutina*, *Atychina*, and the *Tineina* as far as the family *Gelechiidae* inclusive. A great number of new genera are instituted.

——. H. v. Berge's Schmetterlingsbuch. 4^{te} Aufl. gänzlich umgearbeitet und versucht. 40 col. plates, 200 figs. Stuttgart, 4to, 1870.

This is one of those half popular, half scientific works common in Germany, but to which we have no counterpart in England. An introduction, accompanied by a plate of details, is prefixed to the work, which only includes the *Macrolepidoptera*. The plates are excellent.

HELLINS, J. A list of British *Macrolepidoptera* which hibernate in the egg-state. Ent. M. M. vi. pp. 221-223.

——. Description (with notes on variation) of the larva of *Deilephila livornica*. Ibid. vii. pp. 99-102.

HERKLAERTS, F. J. M., fils. Les Macrolépidoptères des environs de Bréda. Tijdschr. Ent. (2) v. pp. 142-157.

551 species are enumerated in this list.

HERRICH-SCHÄFFER, G. A. W. Prodrömus Systematis Lepidopterorum. 4^{te} Lieferung. CB. Ver. Regensb. 1870, pp. 154-160.

Chiefly contains criticisms on Butler's arrangement of the *Hesperiidae*.

——. Die Schmetterlinge der Insel Cuba. Fortsetzung. Ibid. pp. 180-190.

Contains *Geometrina*.

HEWITSON, W. C. Descriptions of 22 new species of Equatorial *Lepidoptera*. Tr. E. Soc. 1870, pp. 153-163.

Supplementary to Hewitson's 'Descriptions of Equatorial *Lepidoptera*,' a separate publication.

——. Descriptions of two new species of *Lepidoptera Rhopalocera*. Ent. M. M. vi. pp. 177, 178.

HEWITSON, W. C. Descriptions of new species of *Erycinidæ*, from Chontales, Nicaragua. Ibid. vi. pp. 226-228.

——. Descriptions of five new species of Diurnal *Lepidoptera* from Chontales, Nicaragua, and of one from Minas Geraes. Ibid. vii. pp. 3-6.

——. Exotic Butterflies. Parts 73-76. Jan. to Oct. 1870. London, 4to.

——. Equatorial Lepidoptera collected by Mr. Buckley. Pt. IV. London: 1870, 8vo, pp. ii, 49-79.

JÄGGI, F. Die Südseite der Simplongasse in lepidopterologischer Beziehung in der ersten Hälfte Juli, 1869. Mitth. schw. ent. Ges. iii. pp. 216-219.

A list of captures, which contains 218 species.

JOURDHEVILLE, C. Calendrier du Microlépidoptériste. Recherche des Chenilles. Suite et fin. 2^e et 3^e partie. Mai-Décembre. Ann. Soc. Ent. Fr. (4) x. pp. 111-134, 232-266 (cf. Zool. Rec. vi. p. 341).

KEFERSTEIN, A. Ein Paar Bemerkungen zu dem Aufsatz des Herrn Peter Maasen über die muthmaassliche Anzahl der Schmetterlinge. S. E. Z. 1870, pp. 353, 354.

——. Entomologische Notizen aus dem Tagebuche des zu Madagascar verstorbenen Herrn Tollin. pp. 17, 3 col. plates. Reprinted from JB. Ak. Erf.

39 species are enumerated; 8 new species are described and figured.

KIRBY, W. F. Notes on the Butterflies described by Linnæus. Tr. E. Soc. 1870, pp. 133-152.

——. Account of a Natural History Excursion on the Continent in the spring of 1869. J. R. Dubl. Soc. v. pp. 436-444.

——. On the necessity of a reform in the generic nomenclature of Diurnal Lepidoptera, illustrated by a review of the genera proposed from the time of Linnæus to the year 1816. P. L. S. x. pp. 494-503.

KNAGGS, H. GUARD. A list of Macrolepidoptera occurring in the neighbourhood of Folkestone. Published by the Folkestone Natural History Society. Folkestone, 1870, pp. 24.

——. The Cabinet List of the Lepidoptera of Great Britain and Ireland, the Tineina being elaborated by H. T. Stainton, F.R.S. &c. 8vo. London, 1870, pp. 22.

The arrangement of this list (which is printed on one side only, for labels) is that of Stainton's 'Manual.' Cf. Doubleday, Ent. v. pp. 108-107.

——. Notes on new and rare British Lepidoptera (excepting Tineina) in 1870. Ent. Ann. 1871, pp. 71-95.

KOCH, G. Die geographische Verbreitung der Schmetterlinge über die Erde. Geogr. Mitth. 1870, pp. 20-25, 52-57, map.

LEDERER, J. Contributions à la faune des Lépidoptères de la Transcaucase. Ann. E. Belg. xiii. pp. 17-54.

A list of species, with numerous remarks, and descriptions of several new species.

——. Nachtrag zum Verzeichnisse der von Herrn J. Habershauer bei Astrabad in Persien gesammelten Schmetterlinge. Hor. Ent. Ross. viii. pp. 3-28, pls. 1, 2.

A supplement to a paper published by Lederer in vol. vi. of the same journal, and noticed in last year's 'Record.' Lederer now records 361 species from Astrabad, and remarks on the geographical distribution of the most interesting among them.

MAASSEN, P. Muthmaassliche Anzahl der Schmetterlinge resp. Bemerkungen zu den Betrachtungen des Gerichtsraths Keferstein. S. E. Z. 1870, pp. 49-62.

——. Ueber Noctuen-Fang. Ibid. pp. 329-333.

MANN, J. Beitrag zur Lepidopteren-Faunen von Raibl in Ober-Kärnthen. Verh. z.-b. Wien, xviii. pp. 39-44.

MAURISSEN, A. H. Supplément à la liste des Macrolépidoptères du Limbourg Néerlandais. Tijdschr. Ent. (2) v. pp. 122-157.

119 are added to the previous list.

MINOT, C. S. American Lepidoptera. P. Bost. Soc. xiii. pp. 83-85, 169-171.

MÖSCHLER, H. B. Tineen der Ober-Lausitz. Abh. Ges. Görl. xiii. pp. 69-85, plate.

This is the first of a series of descriptive papers on the *Tineina* of the district, and contains the *Argyresthidae*. The species of *Argyresthia*, *Cedestis*, and *Ocnerosstoma* are described, first by analytical tables, and then in detail. The plate represents the neurulation of 4 species of *Argyresthia*, and of one of each of the other genera.

——. Beiträge zur Schmetterlingsfauna von Labrador. S. E. Z. 1870, pp. 113-125, 251-254, 265-272, 364-375.

NEWMAN, E. Concerning the Classification of Butterflies. Ent. v. pp. 33-41.

——. An illustrated Natural History of British Butterflies. 8vo. London, 1871, pp. xvi, 176. Parts 1-8, pp. 1-128.

A good popular account of the group. Woodcuts are given of many varieties as well as species, which much increases the value and interest of the work.

NOLCKEN, J. H. W. v. *Cidaria tristata* und *funerata*. Verh. z.-b. Wien, xx. pp. 59-68.

NOLCKEN, J. H. W. v. Lepidopterologische Fauna von Esthland, Livland und Kurland. 2^{te} Abth. Microlepidoptera. 1 Heft. 8vo (Arb. d. naturf. Ver. zu Riga, Heft iii.), pp. 297-465.

This first part contains the *Pyralidina* (121 spp.) and *Tortricina* (382 spp.). Short general remarks are added to each species.

PACKARD, A. S., Jun. A few words about Moths. Amer. Nat. iv. pp. 225-229, plate.

General notes on collecting and transformations. Some metamorphoses are figured, from unpublished drawings by Abbott.

PASTEUR, —. Etudes sur la maladie des vers à soie, moyen pratique assuré de la combattre, et d'en prévenir le retour. 2 vols. Paris, 1870, col. plates.

Vol. i. contains Pasteur's own researches; vol. ii. documents and explanatory extracts. Three principal diseases are defined:—musccardine, caused by *Botrytis bassiana*; pebrine, caused by corpuscles; and "flaquerie," produced by fermentation in the leaf of the mulberry. Pasteur advocates careful isolation of moths for breeding-purposes, and only breeding from proved healthy individuals. (Cf. Dumas, C. R. vol. lxx. pp. 773-776.)

PPAFFENZELLER, F. Neue Tineinen. S. E. Z. 1870, pp. 320-324.

PLÖTZ, C. *Pseudopontia calabarica*, n. gen. et n. sp. S. E. Z. 1870, pp. 348, 349, plate.

PRITWITZ, v. *Diptilon*, ein neues Schmetterlingsgenus. S. E. Z. 1870, pp. 349, 350, fig.

PRYER, H. Hints on preserving Larvæ. Ent. M. M. vi. pp. 201-203.

REED, E. B. Accentuated list of Canadian Lepidoptera. Canad. Ent. ii. pp. .

ROBINSON, C. T. Lepidopterological Miscellanies. Ann. Lyc. N. York, ix. pp. 152-158, 310-312, pl. 1.

Descriptions and figures of new or little-known N. American *Heterocera*.

——. Notes on American Tortricidæ. Tr. Am. Ent. Soc. ii. pp. 261-288, pls. 1, 4-8.

——. Vide GROTE, A. R.

ROGENHOFER, A. Ueber die Synonymie und die früheren Stände von *Earias insulana*, B. (*siliquana*, H.-Sch.) und Beschreibung einer neuen Art. Verh. z.-b. Wien, xx. pp. 869-874.

RÖSSLER, A. Ueber *Cleodora striatella*, S. V., und *Cleodora tanacetella*, Schrank. S. E. Z. 1870, pp. 258-261.

SAUNDERS, W. On the larvæ of some Lepidoptera. Canad. Ent. ii. pp. 74-76.

SCHAUFUSS, L. W. Die exotischen Lepidoptera Heterocera der früher Kaden'schen Sammlung. Nunq. Ot. i. pp. 7-23.

Contains *Castnidae*, *Zygenidae*, and *Sphingidae*.

SCUDDER, S. H. Report upon a collection of Diurnal Lepidoptera made in Alaska by the Scientific Corps of the Russo-American Telegraph Expedition under the direction of Lieut. W. H. Dall. P. Bost. Soc. xii. pp. 404-408.

——. On the synonymy of *Thecla calanus*. Ibid. xiii. pp. 272-276.

——, and BURGESS, E. On asymmetry in the appendages of Hexapod Insects, especially as illustrated in the Lepidopterous genus *Nisoniades*. Ibid. pp. 282-306, plate.

SLACK, HENRY J. The scales of the Lepidoptera: Researches of Dr. Pigott. Stud. n. s. i. pp. 49-58, plate.

SNELLEN, P. C. T. Aanteekeningen op Herrich-Schäffer's Prodromus Systematis Lepidopterorum (Vervolg.). Tijdschr. Ent. (2) v. pp. 138-141.

Contains criticisms on the portion of the work containing the *Pieridine* and *Equitine*.

SPEYER, A. Ueber *Setina aurita-ramosa*, und die Bildung montaner Varietäten. S. E. Z. 1870, pp. 63-76.

——. Nachtrag zu den Bemerkungen über den Hermaphroditismus der Insecten. Ibid. p. 77.

——. Zur Genealogie der Schmetterlinge. Ibid. pp. 202-223.

——. Europäisch-amerikanische Verwandtschaften. Ibid. pp. 400-406.

STANTON, H. T. The Natural History of the Tineina. Vols. xi. & xii. By H. T. Stainton, assisted by Professor Zeller, J. W. Douglas, and Professor Frey. 8vo. London, 1870, pp. xi, 330, 259, each 8 col. plates.

Vol. xi. contains 21 species of the genera *Prays*, *Swammerdamia*, *Zelleria*, *Laverna*, *Glyphipteryx*, *Heliozela*, and *Antispila*; and vol. xii. contains 23 species of *Cosmopteryx*, *Stathmopoda*, *Chauliodus*, *Asychna*, *Ochromolopis*, and *Depressaria*.

——. Remarks on the genus *Gelechia*, as subdivided by Von Heinemann, in his "Schmetterlinge Deutschlands und der Schweiz," zweite Abtheilung, Band ii. Heft 1. Ent. M. M. vii. pp. 165-173.

In this paper Stainton gives the characters of the genera into which Von Heinemann has divided the old genus *Gelechia*, with lists of the English and German species belonging to each.

STANTON, H. T. My Second Visit to the Engadine. Ent. Ann. 1871, pp. 1-14.

——. New British Tineina in 1870. Ibid. pp. 96-100.

Contains notices of 4 species new to Britain and to science.

STANGE, A. Verzeichniss der Schmetterlinge der Umgegend von Halle an der Saale. Ein Beitrag zur Fauna Deutschlands. Leipzig, 8vo, 1869, pp. 108.

Contains notices of times of appearance, localities, habits, &c. 1316 species are enumerated.

STAUDINGER, O. Critical Notes on certain British *Leucanidæ*. Translated from the 'Stettiner Zeitung' for 1869, by A. MÜLLER. Ent. v. pp. 45-47.

Cf. Zool. Rec. 1869, p. 399.

——. Beschreibung neuer Lepidopteren des europäischen Faunen-Gebiets. B. E. Z. 1870, pp. 97-132, 193-208, 273-330.

——. Beitrag zur Lepidopterenfauna Griechenlands. Hor. Ent. Ross. vii. pp. 3-304, 3 plates.

This paper commences with a physico-geographical sketch of the kingdom of Greece, remarks on the extent of the collections made by various entomologists, general observations on nomenclature, variation, &c., and a tabular and general comparison of the Grecian with the allied faunas. The special part contains very full notices of 895 species out of the 899 known to Staudinger to occur in Greece, several of which are described as new. Systematic and alphabetical indexes conclude the paper.

STEFANELLI, P. Sull' odore di umbra o muschio che tramanda la *Sphinx convolvuli*, Linn. Bull. Ent. Ital. ii. pp. 280-282.

——. Catalogo illustrativo dei Lepidotteri Toscani. Parte seconda. Sfingidi. Ibid. pp. 340-357.

TENGSTRÖM, J. M. J. AF. Catalogus Lepidopterorum Faunæ Fennicæ præcursorius. Fauna et Flora Fenn. Förh. x. pp. 287-370.

1233 species are enumerated, a few of which are described as new.

TRIMEN, ROLAND. Notes on Butterflies collected by J. H. Bowker, Esq., in Basuto-land, with descriptions of some new species. Tr. E. Soc. 1870, pp. 341-390, plate.

VAUGHAN, H. Descriptions of three species of *Phycidæ* (from Britain) new to science. Ent. M. M. vii. pp. 130-132.

WALKER, F. A list of the Lepidoptera collected by J. K. Lord, Esq., in Egypt, along the African shore of the Red Sea, and in Arabia, with descriptions of the species new to science. Ent. v. pp. 48-57, 123-134.

Sixty-one species are enumerated, of which 19 are new. The paper has some importance for the geographical distribution of various species.

- WARD, C. Descriptions of new species of Diurnal *Lepidoptera* from Madagascar. Ent. M. M. vi. pp. 224-225; *ibid.* vii. pp. 30-32.
- WEIJENBERGH, H. Quelques observations de Parthénogénèse chez les Lépidoptères. Arch. Néerl. v. pp. 258-264.
- WEIR, J. J. Further observations on the Relation between the colour and the edibility of *Lepidoptera* and their Larvæ. Tr. E. S. 1870, pp. 337-339.
- WESTWOOD, J. O. Description of an undescribed species of Diurnal *Lepidoptera* from Tropical Africa. Ent. M. M. vi. p. 278.
- WEYMER, G. Ueber Noctuenfang. S. E. Z. 1870, pp. 398, 399.
- WHITE, F. BUCHANAN. Notes on the Insects of Strathglass, Inverness-shire. Ent. M. M. vii. pp. 45-53.
- WULLSCHLEGEL, J. Mittheilungen über einen Feind des Weinstockes. Ber. St. Gall. Ges. 1868-69, pp. 179-185.
Habits of *Cochylis wæana*.
- ZELLER, P. C. Beobachtungen über die Spätlinge unter den Lepidopteren des nordöstlichen Deutschlands. Tijdschr. Ent. (2) v. pp. 229-262.
- . De Vlinders van Nederland. Macro-Lepidoptera. Systematisch beschreven door P. C. T. Snellen. S. E. Z. 1870, pp. 81-89.
- . Lepidopterologische Ergebnisse vom Jahre 1869. *Ibid.* pp. 299-315.

GENERAL NOTES.

Koch (*l.c.*) analyzes the geographical distribution of the Lepidoptera at length.

He remarks on the difficulty of obtaining reliable information, and then passes on to consider the five great zones of distribution which he recognizes as distinct, as follows:—

1. The European or Western fauna (nearly corresponding to Scater's Palæarctic Region), distinguished by the genera *Argynnis*, *Melitæa*, *Thais*, *Lycæna*, *Satyrus*, *Erebia*, *Zygæna*, and the *Noctuæ* generally. *Lepidoptera* occur at all elevations (to 9000 feet in the Swiss Alps, and to 18,000 feet in the Andes). Various North-American Sphinges and *Noctuæ* have occurred in Britain, which Koch supposes to have crossed the Atlantic by flight. [It may be remarked that all the North-American species taken in Britain have been taken not in Ireland or in

the west of Scotland, but in England, and many of them near London.] The strongest-flying genera are usually the most widely distributed. The great areas of distribution are therefore not sharply defined, and it is an error to take the distribution of the very limited European fauna as the groundwork of a system applicable to the whole world. Most of the polar species, and those of Europe generally, occur throughout Central and northern Asia, while the Mediterranean fauna extends from the Canaries through North Africa and Southern Europe some distance into Western Asia. The great chains of mountains extending more or less continuously from the Caucasus to the Pyrenees form the boundary of the Mediterranean fauna on the north, and interfere more with the wider spread of species than either the Atlantic [?] or the Mediterranean.

2. Africa, the region of the genera *Anthocharis* [*Callosune*], *Acraea*, *Charaxes*, and *Romaleosoma*. The whole of the northern part of Africa belongs to the European fauna; and Africa may on the whole be regarded as a second section of it. The whole of North Africa, except the Mediterranean fauna, on this side the Atlas is very poor in *Lepidoptera*, compared with the opposite European coasts, in consequence of the want of great forests, and the marshy nature of much of the flat country. Other causes are the heat and dryness of the summer, the burning of the vegetation by the inhabitants, &c. On the whole, the Lepidopterous fauna of Africa is very small for the size of the continent, owing to the great expanse of territory covered by rainless deserts. Several Indian species occur on the coasts of the Red Sea. The principal African genera of *Rhopalocera* are then enumerated, and the number of species occurring in Africa and the other quarters of the globe compared. The following genera are noticed as very poorly represented in Africa:—*Euplœa*, *Danais*, *Thecla*, and *Hesperia*. [No true *Thecla* occurs in Africa south of the Sahara; but Africa possesses several characteristic genera of *Lycænidae*.]

3. The South-Asiatic or Indian fauna: Asia, the district of the genera *Ornithoptera*, *Danais*, *Euplœa*, *Limenitis*, *Adolias*, *Diadema*, and *Parnassius*. This fauna extends over a still wider range than the European, and may be regarded as the original stem of the entire Old-World fauna. It extends from the mountains of Central Asia, throughout India, China, a great part of Australia, and the Pacific Islands. Westward it extends to Arabia and Syria, where it touches the European fauna.

4. Australia and Polynesia: the region of the genera *Antipodites*, *Agarista*, *Hecatesia*, *Synemon*, *Teara*, *Opsirhina*, and *Oiketiscus*. This fauna has without doubt been derived from the Indian by migration, insects being conveyed from one district to another across the sea by the monsoons. The species would then become rapidly modified by the influence of climate. Nothing

is known of the fauna of the interior of Australia; that of the north coast is entirely Indian; and, indeed, the Australian fauna is merely a branch of the Indian. Koch then remarks on some of the peculiarities of Australian forms. The entire Old-World fauna forms one great whole; but for convenience it may be divided into the European and the Indian, the first corresponding with Scater's Palæarctic Region, and the second including the whole of the remainder.

5. The American or Transatlantic fauna, characterized by the genera *Papilio**, *Euterpe*, *Leptalis*, *Pieris*, *Myscelia*, *Catagramma*, *Callicore*, *Perisoma*, *Heterochroa*, *Morpho*, *Caligo*, *Euptychia*, *Hætera*, *Neonympha*, *Thecla*, *Castnia*, *Glaucopis*, *Euchromia*, *Hyperchiria*; also the families *Heliconidæ*, *Erycinidæ*, and *Hesperiidæ*. The American fauna is distinguished by its richness, containing more species than all the other quarters of the world put together, only the Indian fauna at all approaching it. It straggles to the north as far as Baltimore, where it passes into the European fauna. Still the fauna of the United States and California has a character peculiar to itself, which it does not lose till we arrive at the circumpolar fauna. It is probable that if a chain of islands similar to the Indian archipelago extended across the Atlantic in the temperate zone, the North-American fauna would be richer in European forms. The principal characteristic genera found in South America are then enumerated.

Probably, if Europe lay less to the north, the only two faunas which could be distinguished would be the western and the Transatlantic; and the common origin of all the Lepidopterous faunas of the world is shown by the frequent coexistence of the same genera, distinguishable at a glance, in several or in all the widely separated regions of the earth. (Cf. De Borre, Ann. Ent. Belg. xiii. pp. xx-xxiv.)

MAASSEN (S. E. Z. 1870, pp. 49-62) has published a critical analysis of Keferstein's 'Betrachtungen geknüpft an meine Schmetterlingssammlung' (S. E. Z. 1869, pp. 191-230; Zool. Rec. vi. pp. 346, 347). After pointing out the fallacies in Keferstein's calculation of the probable number of *Lepidoptera* existing in the world, he attempts to estimate the number himself, by taking the proportion of 26 moths to one butterfly, which he finds to exist in all approximately complete local lists in Europe. He also estimates the total number of *Lepidoptera* in the world to be 26 times as large as in Europe. Speyer (Linn. Ent. Bd. xii.) estimated the probable number of *Lepidoptera* at 130,000. [Cf. Bates, Tr. E. Soc. 1869, p. xlviii, who estimates them at 227,400, instead of 129,744, which is Maassen's total.]

* *Papilio* is much better represented in the Indo-Australian region than in America. See Wallace's essay on the Malayan *Papilionidæ*.

KEFERSTEIN replies to some of Maassen's criticisms on his paper, S. E. Z. 1870, pp. 353, 354.

SPEYER (S. E. Z. 1870, pp. 202-224) compares the structure and metamorphoses of the *Lepidoptera* and *Trichoptera* in full detail, in order to discover what relation exists between the orders. He considers that the two groups are very nearly allied, the *Trichoptera* having been first developed, but that no very obvious links now exist between them. *Acentropus* he considers to be a true *Lepidopteron*, but a very old form. The most highly developed forms of the *Lepidoptera* are the butterflies; then follow the *Sphinges*, *Noctuæ*, and *Geometræ*, while the *Bombyces* form a transition to the *Microlepidoptera*.

HAGEN suggests that an examination of the genital segments would be of the greatest use in the determination of species in the most difficult groups of *Lepidoptera*, such as *Argynnis*, *Hesperia*, the *Noctuidæ*, *Acentropus*, &c. S. E. Z. 1870, p. 316, note.

J. W. DOUGLAS quotes from Hagen's paper, and adds some remarks of his own. Ent. M. M. vii. pp. 43, 44.

ZELLER (S. E. Z. 1870, pp. 81-89) publishes a critical analysis of Snellen's work on Dutch *Macrolepidoptera*. He argues that misprints and slips of the pen in the spelling of scientific names ought to be corrected, and that our scientific nomenclature ought to commence with the last edition of Linnæus's 'Systema Naturæ.' He entirely disapproves of the names there used being supplanted by those employed by Linnæus in earlier works, or by obsolete names employed by Clerck, Poda, Scopoli, &c.

BOISDUVAL protests against any of Hübner's generic names being retained, whether characterized by subsequent authors or not, leaving it to be inferred that his own manuscript names are preferable. Pet. Nouv. E. no. 19.

T. J. BOLD publishes notes on a few British *Lepidoptera*. Tr. North. Durh. iii. pp. 170-172.

F. BRAUER has published the usual report on the literature of *Lepidoptera* in 1869. Arch. f. Nat. 1870, ii. pp. 161-188. The part of the report relating to general entomology also contains much relating to *Lepidoptera*. The concluding portion of the report on *Lepidoptera* is not yet to hand.

W. M. CROWFOOT (Tr. Norw. Soc. 1869-70, pp. 29-36) remarks on the breeding, variation, and localities of British *Lepidoptera*, the difference in the Indian and European butterfly faunæ, and the resemblance in the *Sphinx* faunæ. He classifies the *Lepidoptera* of Norfolk by their localities, as follows:—marsh, heath, coast, and foreign species, and those frequenting cultivated ground.

J. W. DUNNING remarks on a small collection of insects sent from Kinsembo in Congo, by H. Ansell. Lists of the fifty-nine species of *Rhopalocera* and the twenty-three species of *Heterocera* contained in the collection are appended by Messrs. Butler and Moore. Tr. E. Soc. 1870, pp. 522-528.

GODMAN (Nat. Hist. of Azores, pp. 101-106) gives a list of the *Lepidoptera* found in these islands, 28 in number. Several even of this small number appear to have been introduced; and all, with two exceptions, are well-known British species.

C. S. GREGSON publishes remarks on occasional second broods in single-brooded *Lepidoptera*. Ent. M. M. vii. pp. 18, 19.

LABOULBÈNE has published an article on "Lépidoptères" in the 'Dictionnaire Encyclopédique des Sciences Médicales.' According to a notice in Ann. Soc. Ent. Fr., Séances, 1870, p. 53, it contains a brief sketch of the natural and medical history of the order, remarks on so-called showers of blood, and a valuable bibliography.

NATHUSIUS publishes some microscopical observations on the development of the eggs in *Abraxas grossulariata*, *Pieris rapæ* or *napi*, and *Vanessa urticae*. Z. wiss. Zool. xxi. pp. 130, 131.

RILEY's second report on the noxious Insects of Missouri is reviewed, and several of the illustrations of *Lepidoptera* are reproduced in Amer. Nat. iv. pp. 610-615. [The Recorder has not seen this work.]

SNELLEN VAN Vollenhoven (Tijd. Ent. (2) v. pl. 6) figures varieties of *Deilephila porcellus*, *Psilura monacha*, *Amphidasis betularia*, *Argynnis selene*, *Scioaphila ictericana*, *Lithosia rosea*.

STANTON has published a list of all the new British *Lepidoptera* noticed in the 'Entomologist's Annual' from 1851 to 1871. 222 species of *Heterocera* are recorded. Ent. Ann. 1871, pp. 108-116.

STAUDINGER advocates careful comparative descriptions of new *Lepidoptera* with the allied species. B. E. Z. 1870, p. 97.

WALLACE (Contributions to the Theory of Natural Selection, pp. 45-129) has reprinted, with additions, his essay on "Mimicry and other Protective Resemblances among Animals," which contains much matter relating to *Lepidoptera*.

J. JENNER WEIR has published some additional notes on the relation between the colour and the edibility of *Lepidoptera* and their larvæ, and suggests that the comparative abundance or scarcity of an insect may sometimes be due to the presence or absence of some particular bird that feeds upon it. Tr. E. Soc. 1870, pp. 337-339.

ZELLER (Tijdschr. Ent. (2) v. pp. 229-262) has published a paper on the *Lepidoptera* of North-eastern Germany which appear towards the close of the year. He divides them into hibernating species, late-appearing species, hibernating late appearing species, and accidental stragglers, and enumerates the species under each heading, often with lengthy notices of their larvæ and ordinary times of appearance. Only a small portion of the paper has yet appeared.

A series of articles on insects injurious to the vine has been published in Amer. Ent. ii., commencing with the *Lepidoptera*, which are very fully figured in all their stages. These articles will be referred to under the names of the species noticed.

LARVÆ. Describing—W. Saunders, Canad. Ent. ii. p. 94; Preserving—Pryer, Ent. M. M. vi. pp. 201-203; Parasitic on sloth in Guiana—Bar & Oberthur, Ann. Soc. Ent. Fr. Séances, 1870, p. 8.

Lists of captures of *Lepidoptera*:—Britain, by E. Birchall, in Connemara (Ent. v. pp. 69, 70), in county Wicklow (*l. c.* pp. 121-123), in Sherwood

Forest (*l. c.* pp. 207–209); by T. W. Daltry, in North Staffordshire (*op. cit.* p. 118); by W. Machin, at Hackney Marshes (*op. cit.* p. 184); by T. Eedle, in Perthshire (*op. cit.* p. 199); by W. D. Robinson, in Kircudbrightshire (*op. cit.* pp. 218–220); by D. T. Button, near Gravesend (*op. cit.* pp. 220–222); by H. Marsden, in Gloucestershire (*Ent. M. M.* vi. p. 191); by J. H. A. Jenner, in Sussex (*op. cit.* p. 192); by W. Jagger, at St. Ives (*op. cit.* p. 193); by G. B. Longstaff, in Morayshire (*op. cit.* pp. 213–215); by E. N. Bloomfield, at Guestling (*op. cit.* p. 218) and near Bury St. Edmunds (*l. c.* vii. p. 162); by C. G. Barrett, at Norwich (*op. cit.* vi. pp. 236, 237), at Ranworth (*l. c.* pp. 276, 277), and at Yarmouth (*l. c.* vii. pp. 63, 64); by F. B. White, in Inverness-shire (*op. cit.* pp. 46–51) and near Perth (*l. c.* p. 140); by J. B. Hodgkinson and G. T. Porritt, at Witherslack (*op. cit.* pp. 62, 63); by J. B. Hodgkinson, in Lancashire (*l. c.* p. 87); by J. Traill, at Braemar (*op. cit.* pp. 113, 114); by G. T. Porritt, in Morayshire (*op. cit.* pp. 140–143); and by W. Maling, near Newcastle (*Tr. North. Durh.* iii. pp. 381, 382).—Germany and Switzerland: Kirby (*J. R. Dubl. Soc.* v. pp. 436–443).—Russia: E. Siberia, Erschoff & Maack (*Bull. Mosc.* 1869, pt. 4, pp. 272–274); Omsk, W. Siberia, Erschoff (*l. c.* 1870, pt. 1, pp. 218–240); Mangyrshlak, Becker (*ibid.* p. 126).—Canada: by Bowles, at Quebec (*Rhop.*) (*Canad. Ent.* ii. pp. 95, 96); by Jones, in Nova Scotia (*Rhop.*) (*ibid.* p. 157).

RHOPALOCERA.

NEWMAN has published (*Ent.* v. pp. 33–41) some remarks on the classification of butterflies. He proposes an arrangement founded on the condition of the pupa. He doubts whether any real line can be drawn between the *Rhopalocera* and *Heterocera*, and includes *Synemon* and *Urania* in his arrangement.

H. J. SLACK (*Stud. n. s. i.* pp. 49–58) has been examining the structure of the scales of butterflies. They consist of an upper and a lower layer (not three layers), and in deposits of matter coming from one or both, and lying between the two. "The so-called 'ribs' &c. of butterfly-scales seem to me only corrugations or wrinkles; and the beads, more or less distinct or coalescent, as the case may be, I take to be exudations in drops from the membranes, consolidating, so far as they do consolidate, in a definite form." A plate is added, representing the scales of a few species.

KIRBY (*P. L. S. x.* pp. 494–503) has critically examined the synonymy of the principal genera of Diurnal Lepidoptera published from 1767 to 1816. The rules he proposes are based on the well-known rules of the British Association.

A. G. BUTLER has published a 'Catalogue of Diurnal Lepidoptera described by Fabricius in the collection of the British Museum,' containing many valuable rectifications of synonymy, and the identification of many species previously unnoticed, or referred to genera at random by other authors. The original diagnosis (but not the description) is added to every Fabrician synonym.

BOISDUVAL (Pet. Nouv. no. 18) publishes the following identifications of *Rhopalocera* described by Godart:—*Nymphalis siva*=*Romaleosoma arcadius*, Fabr.; *N. francina*, Godt.,=*Rom. sophron*, Doubl. & Hew.; *N. ischaris*, Godt., is an *Emesis* near *orphna*; *N. eulimene*, Godt.,=*Neptis jocaste*, Feld.

SCUDDER (P. Bost. Soc. xii. pp. 404–408) has published a list of a collection of butterflies made in Alaska by Lieut. W. H. Dall. It only contained 13 species.

TRIMEN has published (Tr. E. Soc. Lond. 1870, pp. 341–390) a list of 62 species of butterflies collected by J. H. Bowker in Basuto-land, with numerous notes on known species, and descriptions of several new ones.

KIRBY has published (Tr. Ent. Soc. 1870, pp. 133–152) a résumé of the species of Diurnal Lepidoptera described by Linnæus, in which he points out several corrections of synonymy.

KIRBY notes the occurrence of 58 species of butterflies, a list of which is appended, within three miles of the town of Hilden, near Düsseldorf. J. R. Dubl. Soc. v. pp. 437, 441, 442.

Several partially gynandromorphous butterflies have been exhibited by Prof. Westwood at the Entomological Society. Proc. E. Soc. 1870, p. 2.

An article on "Imitative Butterflies" is published in Amer. Ent. i. pp. 189–193, illustrated with woodcuts of *Danaïs archippus* and *Limenitis dissippus*.

H. W. PARKER publishes a list of 13 butterflies found in Iowa, in addition to those previously recorded by Scudder in Tr. Chic. Ac. (comp. Zool. Rec. vi. p. 343). Amer. Ent. ii. p. 175.

On rearing butterflies from the egg, see W. H. Edwards, Canad. Ent. ii. pp. 115, 133, 134, 162–164.

Papilionides.

WALLACE has reprinted the introductory portion of his paper on the Malayan *Papilionida*, in which he reiterates his previously expressed opinion that this group is the highest among the *Lepidoptera*, and replies to various arguments which have been brought against this view.

Ornithoptera priamus. Kirby remarks on the differences between Cramer's figure and the typical figure of this insect: Tr. E. Soc. 1870, p. 134. Maassen suggests that *O. tilhonius* may be an accidental aberration of one of the subspecies of *O. priamus*: S. E. Z. 1870.

Papilio. Butler (Cat. Lep. Fabr. pp. 234–250) makes the following notes on various species of this genus:—*P. phænon*, Koll., is a local form of *P. vertumnus*, Cr.; *P. arbates*, Cr.,=*P. anchises*, L.; *P. iphidamas*, ♂, Gray, is distinct from that of Fabricius; *P. harrisianus*, Sw.,=*P. lysander*, Fabr.; *P. protesilaüs*, Dru.,=*P. marcellinus*, Doubl.,=*P. sinon*, Fabr.; *P. leonidas*, Fabr.,=*P. similis*, Cr. nec L., is an imitation of *Danaïs leonora*, Butl.; *P. palamedes*, Fabr. nec Dru.,=*P. acamas*, Fabr.; *P. brutus*, Fabr., is probably distinct from *P. merope*, Cr.

Butler (Lepid. Exot.) also figures the following species previously described by him:—*P. joësa*, l. c. pt. 3, Jan. 1870, p. 21, pl. 8. f. 1, 2; *P. janoo*, l. c. pt. 5, July 1870, p. 33, pl. 13. f. 1; *P. kerosa*, l. c. f. 2; *P. juda*, l. c. p. 34, pl. 13. f. 3, 4.

BOISDUVAL remarks (Lép. Guat. pp. 5–8) that his *Papilio Forzæ*=*P. caliste*, Bates; *P. archesilaus*, Feld.,=*macrosilaus*, Boisd. MS. [Bates, P. Z. S.

1863, p. 241], and is perhaps distinct from *P. protesilaus*; *P. alcamedes*, Feld., = *P. eurimedes*, Cram.; *P. hephæstion*, Feld., = *P. branchus*, Doubl.; *P. rhetus*, Gray, = *P. erostratus*, Westw., ♀.

SCUDDER describes the larva and pupa of *P. rutulus*. *P. Bost. Soc. xiii. pp. 221, 222.*

TRIMEN remarks on *Papilio demoleus* and *erithonius*. *Tr. E. Soc. 1870, pp. 384, 385.*

TROUVELET remarks on the young larvæ of several species of *Papilio*, with special reference to *P. turnus*. *Proc. Bost. Soc. N. H. xii. pp. 92, 93.*

WARD remarks on the ♀ of *P. lalandei*. *Ent. M. M. vi. p. 224.*

Euryades. Burmeister describes the females of both the known species, as well as their anatomical peculiarities. *S. E. Z. 1870, pp. 414-421.* He considers the genus valid.

Thais rumina, Esp., is not *P. rumina*, L. (= *P. rumina*, Dr., = *P. thero*, L.), but = *P. maturna*, L. *Butl. Cat. Lep. Fabr. p. 232.* [Cf. Kirby, *Tr. E. Soc. pp. 147, 148.*]

New species :—

Leptocircus virescens (= *L. curius*, auct. nec Fabr.), *Butler, l. c. p. 259, Java, Moulmein.*

Papilio lycimenes, Boisd. (= *iphidamas*, Gray nec Fabr.), *Lép. Guat. p. 7, Costa Rica*; *P. alaska*, Scudd., *P. Bost. Soc. xii. p. 407, Alaska.*

Parnassius behrii, Edwards, *Tr. Am. Ent. Soc. iii. p. 10, Sierra Nevada.*

Pierides.

BUTLER (*Cist. Ent. iii.*) has published a revision of the genera of the *Pierinæ*, and has given figures of the neururation of nearly all. He tabulates 48 genera, 12 of which are new :—

Leodonta, g. n., type *L. dysoni*, Butl.; *Nychitona*, g. n., type *N. dorothea* (Fabr.); *Daptonoura*, g. n. (Cat. Fabr. p. 209), type *D. flippantha* (Fabr.); *Phrissura*, g. n., type *Ph. cynis* (Hew.); *Pyrisitia*, g. n., type *P. tereas* (Godt.); *Sphænogona*, g. n., type *S. ectriva* (Db.); *Metaporia*, g. n., type *M. agathon* (Gray); *Catasticta*, g. n., type *C. nimbice* (Boisd.); *Leptophobia*, g. n., type *L. eleone* (Hew.); *Herpæmia*, g. n., type *H. tritogenia* (Kl.); *Nepheronia*, g. n., type *N. idotea* (Bd.); *Moschoneura*, g. n., type *M. methymna* (Godt.). He omits *Pseudopontia*, Plötz, regarding it as *Heterocerous*. The received nomenclature is somewhat disturbed, *Synchlœ* being used for *P. brassicæ*, *Pieris* for *P. amathonte*, *Pontia* for *P. cratægi*.

BUTLER states (Cat. Lep. Fabr. pp. 199-231) that *Pieris hira*, Moore, prob. = *P. cassida*, Fabr., = *P. zeuzippe*, var., Cram.; *P. evagete*, Cram., = *Pieris phryne*, Fabr.; *P. coronis*, Cram., = *Pier. nerissa*, ♀, Fabr.; *Pier. amalia*, Vollenh., prob. = *P. licea*, Fabr.; *P. plexaris*, Don., = *Thyca cæneus*, Linn.; *P. hyparete*, Don., = *P. hyp.*, Linn., var. *luzoniensis*, Feld.; *Euterpe pitana*, Feld., = *E. telasco*, Luc., = *P. sisamnus*, Fabr.; *P. philippa*, Fabr., = *P. cesonia*, Stoll; *Colias philippa*, Doubl. & Hew., is distinct; *P. larra*, Fabr., is distinct from *Callidryas philea*, Linn.; *Terias tondana*, Feld., = *P. rahel*, Fabr. nec Boisd. [?; the description of *T. rahel* in Boisd. Sp. Gén. is copied from that of Fabricius]; *Terias drona*, Horsf., = *P. libythea*, Fabr.; *Ter. gentilis*, Boisd., = *Pap. musa*, Fabr.; *P. dorothea*, Fabr., is a var. of *Pontia alcesta*, Cram.; *Pap. clio*, Cram., is a *Leptalis*.

Butler figures (*l. c.*) *Thestias pirithois*, Fabr., = *Th. rhexia*, ♀, Fabr. pl. 1. f. 5; *Leptalis pinthæus*, Linn., pl. 2. f. 1; and *Colias lesbia*, Fabr. pl. 2. f. 2.

TRIMEN publishes notes (Tr. E. Soc. 1870, pp. 378-384) on the following species of this family:—*P. mesentina*, Cram.; *P. hellica*, Linn.; *P. eriphia*, Godt.; *Callosune evenina*, Wallengr.; *C. agoge*, Wallengr.; *Callidryas florella*, Fabr.; and *Colias electra*, Linn. He remarks that *Pontia glaucanome*, Klug, is perhaps a small var. of *Pieris hellica*; *Pontia tritogenia*, Klug, = *Pier. eriphia*, Godt.; *Callidryas rhadia*, Boisd., = the yellow form of *C. florella*, ♀. Bowker has observed a migrating host of the latter species in Basuto-land; and Trimen remarks on the habit of the *Pieridæ* to proceed straight on in one direction. Trimen also figures *Callosune evenina*, Wallengr. (*l. c.* pl. 6. f. 11).

KIRBY remarks (Tr. E. Soc. 1870, pp. 141, 142) that there is some doubt whether *P. hyale*, Linn., may not = *Colias edusa*, Fabr.; *P. coronea*, Cram., = *P. java*, Sparrm.; and *P. gliciria*, Cram., = *P. canidia*, Sparrm.

Leptalis. Hewitson (Exot. Butt. 73, pls. 5-7) figures the following known species:—*L. lelex*, *L. zathoe*, var. ♀ (or *L. lelex*, ♀?), *L. othoe*, *L. lysis*, *L. lygdamis*, *L. carthesis*, *L. deione*, *L. leonora*, *L. larunda* (*larinda* in plate), *L. idonia*, *L. avonia*, *L. ithomia*, *L. teresa*, *L. lua*.

Globiceps paradoxa, Feld. Plötz describes and figures this species as *Pseudopontia calabarica*. S. E. Z. 1870, pp. 348, 349, pl. 3. f. 1 a-f. Kirby inquires (Pet. Nouv. no. 15) whether *G. paradoxa* may not = *Deloneura immaculata*, Trim.; but Hewitson replies (*l. c.* no. 15 bis) that it is a Heterocerous insect, and (*l. c.* no. 23) points out its identity with *Pseudopontia*. R. Felder figures it (*l. c.* no. 24) under the new generic name of *Gonophlebia*, and remarks on its affinities. He still considers it to belong to the *Pieridæ*.

Aporia crategi. Life-history published by Newman, Ent. v. pp. 135, 136. He suggests that its true place is near, if not next to, *Doritis* (*Parnassius*).

Colias ernestius, Lap. Kirby states (Pet. Nouv. no. 19), on Butler's authority, that this species = *P. helcita*, Fabr., the Senegal variety of *Pieris creona*, Cram.

Pieris daphidice. Bienert describes a variety from Persia as var. *persica*. Lep. Ergeb. p. 26.

Pieris protodice. Figured in all its stages in Amer. Ent. ii. pp. 60-77.

Pieris krueperi. Staudinger remarks on the variations of the broods of this species, and calls the first brood var. *vernalis*. He thinks that *P. krueperi* may very probably be a local race of *P. gliciria*, but that it would be very unwise to unite them under one name. Hor. Ent. Ross. vii. pp. 33, 34.

Pieris rape. L'Abbé Provancher has published a popular account of this species and its introduction into Canada. Nat. Can. ii. pp. 13-18 (Rec. Am. Ent. 1867, p. 17).

Pieris rape and *oleracea* are figured and described in all their stages by Minot, Amer. Ent. ii. pp. 74-76.

Pieris rape, var. ? *mannii*, Mayer, is described and figured by Staudinger, *l. c.* pp. 35, 36, pl. 1. f. 1.

On a swarm of white butterflies crossing the Channel, see J. Crompton, Ent. M. M. vii. p. 18.

Anthocharis. Edwards (Butl. N. Amer. Anth. pl. 1) figures *A. reaktirtii*, and *A. cooperii*, Behr (= *angelina*, Boisd.) [= *A. cethura*, Feld. ?].

A. cardamines. A female with male coloration recorded by Fallou, Ann. Soc. Ent. Fr., Séances, 1870, p. 58.

Anthocharis belia, Esp. Staudinger remarks on the different forms of this species. *L. c.* pp. 37-39.

Anthocharis damone. This species does not occur, as stated, in Sicily, but in Greece and Asia Minor. Staudinger, *l. c.* pp. 40, 41.

Callidryas. Butler (Lep. Exot. pts. 3-6, pls. 9, 12, 15, 16) has commenced a monograph of this genus, and figures and describes the following known species:—*C. crocale*, *C. flava*, *C. catilla*, *C. gorgophone*, *C. scylla*, *C. chryseis*, *C. pyranthe*, *C. gnoma*, *C. pyrene*.

Butler states (Tr. E. Soc. 1870) that *C. bracteolata* = *C. cipris*, ♀ (p. 9, note), and that *C. alcmeone* and *C. boisduvalii* appear to be extreme variations of the same species (p. 11 and note).

Rhodocera. Boisduval (Lép. Guat. p. 10) suggests that his *R. lacordairei* may be the ♂ of *clorinde*, Godt., and alludes to a variety of *R. lyside* named *terissa* in his collection, ignoring the description by Lucas (R. Z. 1852, p. 429).

R. rhamni. A female with one fore wing partially coloured like the male is recorded by H. A. Bull, Ent. v. p. 179.

Rhodocera rhamni and *cleopatra*. These species are certainly distinct, and proceed from different larvæ. *R. farinosa*, Zell., is a variety of the first. Staudinger, Hor. Ent. Ross. vii. pp. 42, 43.

Colias. Lederer (Ann. E. Belg. xiii.) notices the larva of *C. aurorina* (p. 19), describes two supposed varieties of *C. myrmidone* (p. 20), one of which is figured (pl. 1. f. 1, 2), and remarks that *C. thisoa* does not appear to be distinct from *C. myrmidone* (p. 21).

Colias eurydice, Boisd., described and figured by Edwards, Butt. N. Amer. Col. pl. 5.

Colias heldreichi, Staud., = *C. libanotica*, Led., = *C. aurorina*, H.-S., var. Staudinger, *l. c.* pp. 41, 42.

Colias aurorina, H.-S. Lederer remarks on the varieties of this species, and figures the larva. Hor. Ent. Ross. viii. p. 7, pl. 1. f. 1.

Colias anthyale, Hübn. Möschler considers this species to be identical with *C. pelidne*, Bd., and with *C. interior* and *C. labradorensis*, Scudd.; *C. occidentalis*, Scudd., may, he thinks, be distinct. S. E. Z. 1870, pp. 113, 114. [Boisduval and Edwards both consider *C. anthyale* to represent one of the varieties of *C. philodice*.]

Colias philodice. W. H. Edwards suggests that two species are confounded under this name. Canad. Ent. ii. p. 79.

Colias hyale. Hellins publishes a description of the young larva. Ent. M. M. vi. p. 232.

Terias. Boisduval (Lép. Guat. pp. 11, 12) remarks on *T. longicauda*, Bates, and *T. mexicana*, Boisd. He describes *T. gratiosa*, Doubl., and proposes the superfluous name *T. depuiseti* for *T. mexicana*, ♀, Boisd. (= *T. damaris*, Feld.).

New species:—

Euterge eurigania, Hewitson, Equat. Lep. p. 78, Ecuador; *E. epimene*, Hew. (= *E. tentamis*, ♀ ?), Tr. E. Soc. 1870, p. 154, Ecuador.

Leptalis praxidice, Hew. *l. c.* p. 153, Ecuador.

Eronia vohemara, Ward, Ent. M. M. vi. p. 224, Madagascar.

Pieris manankari, Ward, *l. c.* vi. p. 224, *P. antisianaka*, Ward, *l. c.* vii. p. 30, both from Madagascar; *P. philoma*, Hewitson, Equat. Lep. p. 79,

Ecuador; *P. lordaca*, Walker, Ent. v. p. 48, Red Sea; *P. iranica*, Bienert, Lep. Ergeb. p. 27, Persia; *P. virginicensis*, Edwards, Tr. Am. Ent. Soc. iii. p. 13, West Virginia, Canada.

Appias vacans, Butler, Tr. E. Soc. 1870, p. 490, Darjeeling.

Belenois incana, South and West Africa; *B. sabrata* (Doubl. MS.), Congo: Butl. l. c. p. 526.

Callidryas. Butler describes the following new species:—*C. lactea*, Ann. N. H. ser. 4, v. p. 361, Lepid. Exot. vi. p. 43, pl. 16. f. 5-7, Australia and Solomon Islands; *C. hinda*, l. c. iv. p. 31, pl. 12. f. 9, 10, Queensland; *C. evangelina*, Tr. E. Soc. 1870, p. 11, Lepid. Exot. v. p. 35, pl. 15. f. 1-3, Flores, Baly; *C. virgo*, Tr. E. Soc. 1870, p. 9, Mexico, Vera Paz, Apolobamba; *C. irrigata*, l. c., Brazil; *C. hartonia*, l. c. p. 10, Jamaica; *C. editha*, l. c., Haiti; *C. jada*, l. c. p. 11, Guatemala.

Colias edwardsii (Behr, MS.), Nevada; *C. emilia*, Oregon; *C. ariadne*, California. Edwards, Tr. Am. Ent. Soc. iii. pp. 11, 12.

Danaides.

BUTLER states (Cat. Lep. Fabr. pp. 1-7) that *Pap. corus*, Fabr., is probably a local form of *Euplœa phænareta*, Schall., and that *Eupl. melpomene*, Butl., = *Pap. sylvester*, Fabr.; *Danaïs crocea*, Butl., = *Pap. aspasia*, Fabr., var.; *Danaïs grammica*, Boisd., = *Pap. eryx*, Fabr. (l. c. pl. 1. fig. 2).

Butler states (Ann. N. H. ser. 4, v. p. 358) that *Euplœa eschscholtzii*, Feld., is a dwarfed specimen of *E. helcita*, Boisd., which is a race of *E. eleutho*, Quoy. *E. angasii*, Feld., is distinct.

Danaïs erippus, Cram. (*archippus*, Fabr.). The occurrence of this species in the South-Sea Islands is noticed by Butler (Ann. N. H. (4) v. p. 359), and in the Azores by Godman (Nat. Hist. Azores, p. 101). Kirby doubts whether this species is not the true *Pap. plexippus*, Linn. Tr. E. Soc. 1870, p. 143. It hibernates in the perfect state (Amer. Ent. ii. p. 210); and its pupa is figured l. c. p. 307.

Danaïs chrysippus. Trimen (Tr. E. Soc. 1870, pp. 344, 345) notes the occurrence of fasciculated anal appendages in a recently disclosed ♂ of this species.

Danaïs leopardus, Butl., = *limniace*, Cram.; *D. limniace*, Butl. olim, = *Euplœa hamata*, MacL., which is apparently distinct. P. Z. S. 1870, p. 725.

New species :—

Euplœa brenchleyi, *E. lorenzo*, *E. imitata*, South Sea Islands, Butl. Ann. N. H. (4) v. pp. 357-359; *E. jessica*, Fiji, Butl. Lep. Exot. iii. p. 20, pl. 8. f. 3.

Danaïs insolata, Butler, Ann. N. H. (4) v. p. 360, South Sea Islands; *D. nossima*, Ward, Ent. M. M. vi. p. 225, Madagascar.

Heliconiides.

BUTLER remarks (Cat. Lep. Fabr. pp. 119-128) that *Eueides leucomma*, Bates, = *Pap. olympia*, Fabr.; *Heliconius sara*, Fabr. sp., is not = *Pap. rhea*, Cram.; *Pap. myrti*, Fabr., = *Hel. ricini*, Linn. sp.; *Pap. clara*, Fabr., is not = *Hel. sylvana*, Cram. sp.; *Pap. hippodamia*, Don., = *Ithomia hipp.*, Hew., is not *Thyridia hippodamia*, Fabr. sp. (Butler, l. c. pl. 1. f. 1); *Pap. hyalinus*, Fabr., probably = *Ithomia lavinia*, var., Hew.; *Pap. obscuratus*, Fabr., is a dark var. of *Hymenitis sao*, Hübn.

Eueides acacetes, Hew., = *E. lampeto*, Bates. Hewitson, Equat. Lep. preface, p. ii.

HEWITSON notes (Equat. Lep. p. ii) that Herrich-Schäffer has proposed the name *vanilia* for *Ithomia lavinia*, Hew. f. 85, 96. His own name *T. mirza* is therefore discarded.

BOISDUVAL (Lép. Guat. pp. 27-35) states that the genera *Lycorea* and *Ituna* belong to the *Danaides*, and that *Lycorea pasinuntia*, *ceres*, and *atergatis* are probably only modifications of one species. He remarks on the larvæ of *Heliconia*, *Mechanitis*, &c., doubts if *Heliconia zuleika*, Hew., truly belongs to the genus, states that *Tithorea duenna*, Bates, and *tarracina*, Hew., may ultimately form a new genus, proposes the name *Xanthocleis* for the genus *Thyridia*, Hübn. (sec. typ., = *Methona*, Doubl., as restricted by Bates), describes as new *Mechanitis doryssa* (*doryssus*, Bates), refers *Heliconia telchinia*, Doubl. & Hew., to the genus *Mechanitis*, and substitutes the MS. name *Ithomia euphane*, Klug, for *agrippina*, Hew.

Corbulis, g. n., Boisd. Lép. Guat. p. 32. Differs from *Ithomia* by its reddish, semitransparent wings, and from *Hymenitis* by the absence of a transverse band in the discoidal cell of the fore wings. Type *Ithomia agrippina*, Hew.

Leucothyris, g. n., Boisd. l. c. Size small; antennæ slender, rather long; fore wings black, with white spots at the tip; discoidal cell white; hind wings white or ferruginous, with a black border. Type *Ithomia ilderina*, Hew.

*Ceratomia**, g. n., Boisd. l. c. A black spot in the discoidal cell of fore wings. Type *Ithomia stella*, Hew.

Choridis, g. n., Boisd. l. c. p. 33. Size rather large; wings slightly transparent, rather broad, somewhat yellowish, with the nervures, border, extremity of the discoidal cell of fore wings, and a transverse ray in the cell black; hind wings with the border large, with a row of white points; antennæ long, slender, not clubbed. Type *Ithomia peridia*, Hew.

Hyalyris, g. n., Boisd. l. c. Antennæ very long, gradually expanding into a club at the tip; wings transparent, rather smoky, and somewhat largely bordered with black; fore wings with no trace of transverse bands, generally tinted with yellow or fulvous towards the anal angle. Type *Ithomia cæno*, Doubl. & Hew.

Godyris, g. n., Boisd. l. c. Not characterized. Type *Dircenna duillia*, Hew.

Pagyris, g. n., Boisd. l. c. p. 34. Antennæ short, expanding into a club; wings large, robust; fore wings with a band on the extremity of the discoidal cell; nervures thick and prominent. Type *Ithomia ulla*, Hew.

Semelía, g. n., Boisd. l. c. p. 35. Not characterized. Type *Eueides vibilia*, Cram.

New species:—

Heliconia rosina, Costa Rica, Mexico; *H. euryus*, Guatemala; *H. thetis*, Nicaragua: Boisd. l. c. p. 29.

Olyrus montagui, Butler, Tr. E. Soc. 1870, p. 490, Bogotá.

* Too near *Ceratomia* and *Ceratinia*, both used in *Lepidoptera*, the latter in this family.

Ithomia. Hewitson describes from Ecuador:—*I. lycora*, Equat. Lep. p. 79; *I. pulcheria*, Tr. E. Soc. 1870, p. 154; *I. praxilla* and *I. oxia*, l. c. p. 155; *I. pronuba*, l. c. p. 156.

Ithomia fzeella and *I. depauperata*, Boisd. Léop. Guat. p. 84, Guatemala.

Melinea phasiana, Butler, Tr. E. Soc. 1870, p. 489, Peruvian Amazons; *M. zaneka*, l. c., Archidona; *M. ishka*, l. c. (= *Mechanitis menophilus*, Hew. f. 3). [Felder (Reise Nov. Lep. iii. p. 356) has already proposed the name *messe-noides* for *menophilus*, Hew. f. 2, thus restricting the name *menophilus* to Hewitson's f. 3.]

Acræides.

BUTLER remarks (Cat. Lep. Fabr. pp. 128–135) that *Pap. macaria*, Fabr., = *Planema euryta*, ♂, Cram., and is distinct from the *macaria* of Godart; *Acræa carmentis*, Doubl. & Hew., is a slight var. of *Planema jodutta*, Fabr., sp.; *P. macarina*, Butl. (Ashanti form of *Acræa alciope*, Hew.), is probably *P. jodutta*, ♂; *Pap. pasiphaë*, Fabr., = *Pap. medea*, Cram., is an aberration of *Gnesia egina*, Fabr.

TRIMEN remarks (Tr. E. Soc. 1870, pp. 345–347) on specimens of *Acræa neobule*, *A. natalica*, and *A. anacreon*, taken in Basuto-land by J. H. Bowker. He now considers *A. natalica* to be distinct from *A. hypatia*.

Acræa andromacha. Butler has observed some aberrations in the neururation of the hind wings of this species, which leads him to doubt the value of neururation as a specific character in *Ithomia* &c. He thinks, too, that new genera may sometimes be formed by variations in neururation becoming constant. P. Z. S. 1870, pp. 777, 778.

Acræa percussa, sp. n. (= *A. igati*, var. ?), Keferstein, Entom. Notiz. p. 13, f. 1, 2, Madagascar.

Nymphalides.

BOISDUVAL (Lép. Guat. pp. 36–53) proposes the name *Synalpe* for *Clothilda*, Blanch.; remarks that *Biblis aganisa*, Boisd., and *Didonis pasira*, Doubl. & Hew., are perhaps only vars. of *hyperia*, Cram. (*biblis*, Fabr.), and that *bonplandi*, Latr., is perhaps not a *Synchloë*; describes *Synchloë paupera*, Feld., as new; proposes the name *Corybas* for *Pyrrhogyra*, Hübn., and states that *P. otoluis*, Lacordaire [Bates], is probably only a var. of *tipha*, Linn.; remarks on *Heterochroa iphichus*, Linn., and the species which have been confounded with it; notes the differences between *Chlorippe laura*, Dru., and *C. acca*, Feld.; states that *Apatura lucasii*, Doubl. & Hew., = *cyane*, Latr.; proposes the name *Helicodes* for *Protogonius*, Hübn.; and complains that Doubleday has applied his [MS.!] name *cecrops* to a variety of *Prot. fabius*, instead of to some Brazilian species to which it belongs; and notes that *ryphea*, Cram., which has been confounded by Godart with *phidile*, Hübn., = *Paphia helie*, Linn. *Siderone mars*, Hew. [Bates], is probably the male of *marthesia*, Cram.

BUTLER (Cat. Lep. Fabr. pp. 46–119) notes on species of this family that *P. herse*, Fabr., = *P. lycaon*, ♀, Fabr., and is an *Apatura* near *alicia*, Edwards; *Abrota ganga*, Moore, = *P. mirus*, Fabr., ♀; *Hypanartia tecmesia*, Hübn., = *Eurema pavillus*, Fabr.; *P. mardania*, Cram., = *Cystineura dorcas*, Fabr.; *P. pandora*, Fabr., may be a var. of *Atella columbina*, Fabr. nec Cram.

Butler also (l. c. pl. 1) figures the following species described by Fabricius:—*Terinus allia*, *Limnitis martha*, *Junonia zelima*.

TRIMEN remarks (Tr. E. Soc. 1870, pp. 351–358) on several known species of this family. He mentions (p. 353, note) that *Pap. clelia*, Cram., = the true *Junonia enone*, Linn. [?] The other species noticed are *Atella phalantha*, *Pyrameis cardui*, *Junonia cebrene* (sp. n.), *J. clelia*, *J. pelasgis*, *J. cloantha*, *Diadema misippus*, and *Meneris tulbaghia*.

Melitæa harrisii and *Euptoieta claudia*. Larvæ noticed by W. H. Edwards, Canad. Ent. ii. pp. 163, 164.

Melitæa cinxia, L., is correctly identified. Kirby, Tr. E. Soc. 1870, p. 148.

Melitæa phæbe. Staudinger describes and figures var. *caucasica*. Hor. Ent. Ross. vii. pp. 59, 60, pl. 1. f. 2.

Melitæa didyma. Staudinger describes vars. *meridionalis* (*orientalis*), *dalmatina* (*araratica*), and *græca*, l. c. pp. 60, 61. Var. *græca* is figured, l. c. pl. 1. f. 3. An accidental variety is described by A. Curo, Bull. Ent. Ital. ii. p. 32.

Melitæa athalia and *dictynna*. Maassen remarks on these species. S. E. Z. 1870, p. 55. See also Keferstein, l. c. p. 354. A var. of *M. dictynna* from E. Siberia is noticed by Erschoff, Bull. Mosc. 1869, pt. 4, p. 273.

Argynnis adippe. The claims of this species to be considered distinct from *A. niobe* have been debated at some length by Butler, Müller, Doubleday, and others. Pr. E. Soc. pp. 9, 14, 16, 24; Ent. v. pp. 27, 28, 42, 43.

Argynnis niobe. Prittwitz figures an aberration of the ♂. S. E. Z. 1870, pl. . f. 9.

Argynnis japonica, Ménétr. Butler states that this species is a variety of the Indian *A. rudra*, Moore, which is a local form of the European *A. laodice*. Pr. E. Soc. 1870, p. 35.

Argynnis aglaia. A variety is described by J. Watson, Ent. v. p. 164.

Argynnis euphrosyne. A. E. Hudd noticed this insect flying towards the similarly coloured handle of his umbrella. Ent. M. M. vii. pp. 109, 110.

A. selene. Larva described by W. Buckler, Ent. M. M. vii. pp. 114–117. A variety described by Fallou, Ann. Soc. Ent. Fr. Séances, 1870, p. 58; another from E. Siberia noticed by Erschoff, Bull. Mosc. 1869, pt. 4, p. 273.

Argynnis aphirape is not found coextensive with its food-plant, but is excessively local. Maassen, S. E. Z. 1870, pp. 56, 57. Var. *isabella*, from Karelia, described by Tengström, Fauna et Flora Fenn. Förh. x. p. 293, note.

Argynnis edwardsii, Reak., described and figured by Edwards, Butt. N. Amer. Arg. pl. 11.

Argynnis behrensii, Edw., and *A. zerene*, Boisd. (= *A. hydaspe*, Boisd.) figured by Edwards, l. c. Arg. pls. 12, 13.

Argynnis pales. Staudinger describes var. *caucasica*, Hor. Ent. Ross. vii. p. 61, pl. 1. f. 4, and var. *græca*, l. c. p. 62. An accidental var. of the form *is* is described by A. Curo, Bull. Ent. Ital. ii. p. 33.

Eresia. Hewitson (Exot. Butt. 76, pls. 8, 9) figures the following known species:—*E. alsina*, *E. pelonia*, *E. sestia*, *E. casiphia*, and *E. letitia*.

Grapta. Edwards (Tr. Am. Ent. Soc. iii. pp. 1–9) gives the synonymy of *G. interrogationis*, Fab., and a closely allied species as follows:—*G. interrogationis*, Fab. Suppl. ♀; Godt., ♀; Harr. Ins. Mass. text, ♂, ♀ = *c-aureum*, Boisd. & Lec. (nec Linn.), plate ♂, text ♀, = *umbrosa*, Lintn.; *G. fabricii*, sp. n., = *c-aureum*, Cram. (nec Linn.), Fab. Sp. Ins.; Ent. Syst.;

Abbot; Boisd. & Lec., text, = *interrogationis*, Godt., pp. 302, 819 (var.); Harr. Ins. Mass. ed. 2, plate; Lintner. The transformations of both species are described, and the allied species referred to. Scudder (P. Bost. Soc. xiii. p. 276) regards *c-aureum*, Cram. & Abbot, as distinct, and proposes the name *crameri* for it.

Grapta faunus, Edw., described and figured by Edwards, Butt. N. Amer., *Grapta*, pl. 1.

Vanessa huntera occurs in Madeira. Godman, Nat. Hist. Azores, p. 332. [It is abundant in one of the Canary Isles.]

On varieties of *Vanessa io* and *Pyrameis atalanta*, see F. Enock, Ent. v. p. 142.

Vanessa charonia, Dru., = *Pap. canace*, Linn.: Kirby, Tr. E. Soc. 1870, p. 146.

Vanessa polychloros. Life-history described by Newman, Ent. v. pp. 158-160; additional notes by J. Merrin, l. c. pp. 178, 179.

Vanessa urticae. A dwarf specimen has been reared by F. Bond, Proc. Ent. Soc. Lond. 1870, p. 39. On parasites infesting this species, see G. T. Porritt, Ent. v. p. 166. Staudinger remarks on vars. *turcica* and *ichnusa*, and characterizes var. *polaris*, Hor. Ent. Ross. vii. pp. 57, 58.

Vanessa antiopa. Larva described by Newman, Ent. v. pp. 211, 212.

Ageronia arete, Doubl. & Hew. Boisdual states that this insect = *Arethusia*, ♂, and is distinct from his *Peridromia arete* [described by Lucas, Rev. Zool. 1853, p. 310], of which he gives a short description.

Callithea whitelyi, Salv., is figured by Hewitson, Exot. Butt. 74, *Call.* and *Agrias*, pl. 2. f. 7, 8. He also figures his own *C. buckleyi* (l. c. f. 9, 10).

Limenitis proserpina. Sexes contrasted by C. P. Whitney. P. Bost. Soc. xiii. p. 85. It occurs in Illinois, E. G. Boutell, Amer. Ent. ii. p. 241.

Lim. ursula and *L. disippus*. T. W. Higginson remarks on these species. Amer. Ent. ii. p. 177.

Lim. disippus. Larva described, Amer. Ent. i. p. 193, note.

Lim. lorquini, Boisd., described and figured by Edwards, Butt. N. Amer. *Lim.* pl. 3. The larva is also noticed, from Behr's observations.

Lim. bredowii, Hübn. (= *eulalia*, Doubl., = *californica*, Butl.), figured by Edwards, l. c. *Lim.* pl. 4.

Agrias beatifica, Hew., is figured by Hewitson, Ex. Butt. 74, April 1870, *Callithea* and *Agrias*, pl. 2. f. 5, 6.

Charaxes. Butler (Lep. Exot. iv. pl. 10) figures and describes the following known species:—*C. pelias*, *C. phraortes*, *C. druceanus*, *C. zephyrus*, *C. alludinis*, *C. bohemani*.

BUTLER has published (Tr. E. Soc. 1870, pp. 119-121) a series of notes on the species of *Charaxes* described by Felder:—*C. mandarinus* probably = *C. narceus*; *C. attalus* probably = *C. athamas*; *C. bharata*, of which *C. arja* is a var., is perhaps distinct; *C. brennus* is not *C. latona*, but perhaps *C. affinis*, ♀; *C. parmenion*, *demonax*, and *amycus* are probably vars. of *C. affinis*; *C. scylax* = *C. baja*; *C. hierax* and *C. hipponax* = *C. bernardus*; *C. pleistoanax* is a white-banded race of the same.

Paphia glycerium. Transformations figured and described, Amer. Ent. ii. pp. 121-123.

Paph. onophis, Feld. Boisdual describes this species as new, Léop. Guat. p. 50.

Chlosyne, g. n., Butl. Cist. Ent. iii. p. 38, = *Synchlœ*, auct. nec Hübn.

New species :—

- Terinos lucilla*, Butler, Tr. E. Soc. 1870, p. 489, Luzon.
- Argynnis nevadensis*, Edw. Tr. Am. Ent. Soc. iii. p. 14, Nevada; *A. angarensis*, Erschoff, Bull. Mosc. 1870, pt. 1, p. 112, Irkutsk.
- Melitæa helvia*, Scudd. P. Bost. Soc. xii. p. 405, Alaska.
- Eresia bella* (Kirb. MS.). Hewitson adopts this name for *E. mylitta*, Hew. nec Edwards, Equat. Lep. Preface, p. ii, Ecuador. Figured Ex. Butt. 76, Oct. 1870, *Eresia*, pl. 9. f. 71.
- Synchlœ pretona*, Boisd. (= *lacinia*, var. ?), Lép. Guat. p. 37, Guatemala.
- Grapta fabricii*, Edw. Tr. Am. Ent. Soc. iii. p. 5, United States; *G. dryas*, Edw. l. c. pp. 7, 17, West Virginia; *G. silenus*, Edw. l. c. p. 15, Oregon; *G. zepphyrus*, Edw. l. c. p. 16, Nevada, Colorado; *G. marsyas*, Edw. l. c., California; *G. crameri*, Scudd. P. Bost. Soc. xiii. p. 276, Southern United States.
- Junonia antea*, Ward, Ent. M. M. vi. p. 225, Madagascar; *J. westermanni*, Westwood, op. cit. p. 278, Guinea; *J. cebrene* (et *crebrene*), Trimen and Butler, Tr. E. Soc. 1870, pp. 353, 524, Africa.
- Timetis thonis*, Boisd. l. c. p. 44, Honduras, Oajaca.
- Eubagis thalassina*, Boisd. l. c. p. 42, Costa Rica.
- Catagramma phytas*, Boisd. l. c. p. 41, Guatemala and Columbia.
- Pyrrhogyra ophni*, Butler, Ann. N. H. ser 4. v. p. 362, Minas Geraes.
- Ageronia ævoë*, Costa Rica, Yucatan; *A. amphichlœ*, Guayaquil: Boisd. l. c. p. 26.
- Heterochroa calliphicea*, Butler (= *Pap. cytherea*, Cr. nec Linn.), Cat. Lep. Fabr. p. 58, Bolivia? *H. felderi*, Costa Rica; *H. oberthuri*, *H. loræ*, Guatemala; *H. ræla*, Honduras, Mexico: Boisd. Lép. Guat. pp. 45, 46.
- Godartia ansellica*, Butl. Tr. E. Soc. 1870, p. 525, Kinsembo.
- Romaleosoma lakuma*, Butl. l. c. p. 123, Gold Coast.
- Tanaëcia orphne*, Butl. Ann. N. H. (4) v. p. 362, Sarawak.
- Adolias laverna*, Butl. Cist. Ent. ii. p. 29, Borneo, Penang.
- Agrias zenodorus*, Hew. (= *A. ædon*, var. ?), Tr. E. Soc. 1870, p. 156, Ecuador.
- Chlorippe mileta*, Boisd. (♂ = *laura*, Doubl. & Hew. nec Dru.; ♀ = *laurentia*, Hew. nec Godt.), Lép. Guat. p. 47, Brazil; *C. mentas*, Boisd. (= *A. angelina*, var., Feld.), l. c. p. 48, Honduras, Mexico.
- Prepona louisa*, Butl. Cist. Ent. ii. p. 30, Lepid. Exot. vi. p. 49, pl. 18. f. 1, Cuba; *P. phæbus*, Boisd. Lép. Guat. p. 52, Honduras, Mexico.
- Charaxes imma*, Butl. Tr. E. Soc. 1870, p. 122, pl. 4. f. 2, India; *C. hemana*, Butl. l. c. f. 1, Nepal; *C. cinadon*, Hew. (= *C. druceanus*, Butl., vide Lepid. Exot. iv. p. 26), Ent. M. M. vi. p. 177, Natal.
- Philognoma ussheri*, Butler, Tr. E. Soc. 1870, p. 124, Gold Coast.
- Paphia eubæna*, Guatemala, Mexico; *P. anomais*, Costa Rica: Boisd. l. c. pp. 50, 51.

Morphides.

BUTLER (Lepid. Exot. iv. & vi. pls. 11 & 19) figures the following described species of this family:—*Amathusia ottomana*, *Morpho luna*, *M. æga* (*Zeuxidea wallacei*, Feld., = *Z. amethystus*, Butl. l. c. p. 29). *Oreas dubia jaira*, Hübn., is a slight var. of *Tenaris selene*, Westw.: Butler, Tr. E. Soc. 1870, p. 487.

Morpho. Boisduval (Lép. Guat. pp. 60, 61) remarks that *Pap. telemachus*, Cram., is the true ♀ of that of Linnæus; *M. montezuma*, Guén., and *M. octavia*, Bates, are probably vars. of *M. corydon*, Deyr. [Guén., = *M. peleides*, Koll.]; *M. justitiæ*, Salv. & Godm., probably = *M. thesæus*, Deyr.

New species :—

Amathusia pollicaris, Luzon; *A. virgata*, Macassar, Celebes: Butl. Tr. E. Soc. pp. 485, 486.

Tenaris diana, Ternate; *T. fulvida*, Mysol: Butl. l. c. p. 487.

Morpho juturna, Butl. Cist. Ent. ii. p. 28, Lepid. Exot. vi. p. 49, pl. 19. f. 1, New Granada.

Brassolides.

Caligo hemichroa, Butl. This species is described and figured by Butler, Lepid. Exot. iv. p. 29, pl. 11. f. 2.

Caligo arisbe, Hübn., = *taramela*, Godt: Boisduval, Lép. Guat. p. 57.

Morpho (Caligo) ilioneus. On a specimen of the imago with the head of the larva, see Hagen, P. Bost. Soc. xii. p. 163.

Pavonia eurylochus, Cram. Boisduval [Lép. Guat. p. 57] alludes to an opinion that the specimens usually referred to this species from Brazil and Guatemala form two species distinct from the type from Guiana.

Eryphanis. Boisduval (l. c. p. 58) states that *reevesii*, Doubl. & Hew., = *automedon* ♀, and describes in full *E. æsacus*, Herr.-Schäff.

Caligo, Hübn. Contrary to his usual practice, Boisduval (l. c. p. 54) adopts this name because several authors have used it, but he applies it to *Opsiphanes* (!). He proposes the name of *Caligo fabricii* for Cramer's figure 106 A, which all authors consider to represent *cassia*, Linn., and makes no mention of *Ops. crameri*, Feld. (= *cassia*, Cram. 105 A, B). He also re-describes as new [*Ops.*] *tamarindi*, Feld.

Megastes, g. n., Boisd. Lép. Guat. p. 53. Not characterized; includes *Pap. darius*, Fabr., and *Brassolis macrosiris*, Doubl. & Hew.

Eryphanis, g. n. (also *Euryphanis* and *Eryphane* !), Boisd. l. c. p. 57. Males with a dull brownish or yellowish spot at the base of the abdominal groove, varying in form in each species. Palpi contiguous, clothed, the last joint pointed. Type *Pap. automedon*, Cram.

New species :—

Opsiphanes orgetorix, Hewitson, Ent. M. M. vi. p. 177, Chontales.

Caligo oberon, Butl. (= *Potamis conspicua teucer*, Hübn. nec Linn.), Tr. E. Soc. 1870, p. 488, South America.

Pavonia dardanus, Honduras, Guatemala, Columbia; *P. scamander*, Guatemala, Nicaragua, Venezuela; *Eryphanis wardii*, Guatemala, Nicaragua: Boisd. l. c. pp. 56-58.

Satyrides.

BOISDUVAL (l. c. p. 61) states that the genera *Dyctis* and *Cœlites* do not belong to this family, and should be placed near *Hyades* and *Clerome*.

BUTLER (Cat. Lep. Fabricius, pp. 8-37) makes the following notes on species of this family :—*Pap. gerdrudtus*, F., is a *Cærois*; *Gnophodes betsimena*,

Boisd. sp., = *Pap. pythia*, Fabr.; *G. morpena*, Butl., = *Pap. chelys*, Fabr. nec auct.; *Pap. phorcys*, Fabr., = *Taygetis celia*, Cr. sp.; *Euptychia gemma*, Hübn., = *Pap. cornelius*, Fabr.; *Pap. mergus*, Fabr., = *Erebia eumenis*, Frey. sp., = *Ereb. medusa*, Denis, sp., race; *Pap. magus*, Fabr., = *Pap. hyperbius*, Cr. nec Linn., = *Pseudonympha cassius*, Godt. sp.; *Antirrhæa lindigii*, Feld., = *A. casta*, Bates, = *Pap. multiades*, Fabr.; *Mycalasis sanaos*, Hew., prob. = *Pap. martius*, Fabr., local form.

Debis dyrta, Feld., is perhaps a slight variety of *D. drypetis*, Hew. Butler, P. Z. S. 1870, p. 725.

Euptychia. Butler states (Ent. M. M. vi. pp. 251, 252) that the following species are probably varieties of others:—*E. sosybius*, Fabr., of *E. hermes*, Fabr.; *E. atalanta*, Butl., of *E. fallax*, Feld.; *E. pieria*, Butl., of *E. usitata*, Butl. He also (Lepid. Exot. v. pl. 18) figures the following known species of *Euptychia*:—*E. cælica*, *E. ashna*, *E. albofasciata*, *E. tiessa*.

Neonympha eurythris, Fabr. Transformations described by W. Saunders, Canad. Ent. ii. pp. 139–142.

Erebia melas. Staudinger describes a Greek variety of this species. *E. lefevrei*, Boisd., is a Pyrenean variety; and *E. hewitsoni*, Led., from Imeritia, may be another local form, which would then unite *E. melas* and *evias*. Hor. Ent. Ross. vii. pp. 65–67.

Erebia ligea. Tengström describes var. (or sp. n.?) *euryaloides* from Finland, Fauna et Flora Fenn., Förh. x. p. 295, note.

Erebia medea. Larva described by Buckler (Ent. M. M. vii. pp. 64–66), and Newman, Ent. v. pp. 136, 137.

TRIMEN remarks on *Erebia hippia* and *E. narycia*, and figures the latter. Tr. E. Soc. 1870, pp. 350, 351, pl. 6. f. 1.

Chimobas. Möschler discusses at some length the very difficult and much disputed synonymy of this genus, and gives a list of the species which occur in Labrador, with their full synonymy. S. E. Z. 1870, pp. 216–225.

Arge galathea. This species does not deposit its eggs on any plant, but rests on a blade of grass, and drops an egg at the roots, then flies a few feet, and drops another. Bignell, Ent. v. pp. 31, 32.

Satyrus beroë, Freyer. Lederer figures a variety from Transcaucasia. Ann. E. Belg. xiii. p. 26, pl. 1. f. 3.

Satyrus amalthea, *anthelea*, and *telephassa* appear to be forms of one species. Staudinger, Hor. Ent. Ross. vii. pp. 68–70.

Satyrus mamurra, H.-S. Staudinger describes var. *græca*, and points out the differences between the 5 known forms of the species, viz. *pelopea*, *mamurra*, *mniszecchii*, *caucasica*, and *græca*, l. c. p. 70.

Satyrus fatua (*sichæa*, Led.) is distinct from *S. allionia*. Staudinger, l. c. pp. 72–74.

Satyrus cordula, F., *S. bryce*, *S. amasina*, *S. podarce*, *S. actæa*, *S. parthica*, and probably *S. virbius* also, are local forms of one species. Staudinger, l. c. vii. pp. 74–77.

Pararga mæra, L. Bienert describes var. *adrastoides* from Persia, Lep. Ergebn. p. 30; *P. dejanira*, a variety from E. Siberia, noticed by Erschoff, Bull. Mosc. 1869, pt. 4, p. 273.

Ypthima philomela, Linn., is probably = *Pap. baldus*, Fabr., and is distinct from *Y. philomela*, Hübn.: Kirby, Tr. E. Soc. 1870, p. 143.

New species :—

Hætera heracles, Boisd. (= *Pap. luna*, var. ♀, probably = *H. pallida* or *H. rubecula*, Salv. & Godm.), Léop. Guat. p. 61, Honduras.

Anchiphlebia ornata, Butler, Ann. N. H. (4) v. p. 362, Lep. Exot. v. p. 38, pl. 13. f. 5, Cayenne.

Antirrhæa phasiana, Maracaibo; *A. scoparia*, Butl. Cist. Ent. p. 22.

Lethe distans, Butl. Tr. E. Soc. 1870, p. 488, Darjeeling.

Euptychia. Butler describes and figures the following new species of this genus :—*E. oreba*, Cist. Ent. ii. p. 19, Ent. M. M. vi. p. 252, pl. 1. f. 7, hab. — ♀; *E. jaresia*, Cist. Ent. ii. p. 20, Ent. M. M. vi. pl. 1. f. 5, hab. — ♀; *E. muscosa*, Cist. Ent. ii. p. 20, Ent. M. M. vi. pl. 1. f. 6, Brazil; *E. libitina*, Cist. Ent. ii. p. 21, Brazil; *E. fetna*, Ent. M. M. vi. p. 250, pl. 1. f. 1, San Geronimo; *E. labe*, l. c. f. 2, Veragua and Plochic valley; *E. gulnare*, l. c. f. 3, Panama; *E. maimonne*, l. c. p. 251, pl. 1. f. 4, Pebas; *E. undina*, l. c. p. 252 (= *P. similis*, Butl. P. Z. S. 1867 nec 1866), *E. lobelia*, Lepid. Exot. vi. p. 47, pl. 18. f. 5, *E. umbrosa*, l. c. f. 8, *E. francosa*, l. c. p. 49, pl. 18. f. 3, all from Ecuador.

Neonympha metaleuca, Boisd. Léop. Guat. p. 63, Guatemala.

Leptoneura bowkeri, Trimen, Tr. E. Soc. 1870, p. 347, pl. 6. f. 2, Basuto-land.

Erebia rakoto and *E. ankaratra*, Ward, Ent. M. M. vii. p. 30, both from Madagascar.

Epinephile cyri, Bien. Lep. Ergeb. p. 31, Persia; *E. comara*, Led. Hor. Ent. Ross. viii. p. 12, pl. 1. figs. 9, 10, Astrabad; *E. naricina*, Staud. (= *narica*, Hübn., var. ♀) B. E. Z. 1870, p. 100, Sarepta.

Mycæsis ignobilis, Butler, Tr. E. Soc. 1870, p. 124, Gold Coast; *M. vola*, *M. ankova*, *M. iboina*, and *M. avelona*, Ward, Ent. M. M. vii. p. 31, all from Madagascar.

Cænonympha symphita, Lederer, Ann. E. Belg. xiii. pp. 27, 44, Transcaucasia.

Cænonympha iphis, var. *iphioides*, Staud. B. E. Z. 1870, p. 101, Old Castile.

Lymanopoda issacha, Butl. Cist. Ent. ii. p. 26, Cuba; *L. labineta* and *L. trimaculata*, Hew. Tr. E. Soc. 1870, p. 159, both from Ecuador.

Steroma zibia, Butl. Cist. Ent. ii. p. 23, Venezuela.

Pedaliodes. Butler (Cist. Ent. ii. pp. 24, 25) describes *P. japhleta*, *P. rapa*, hab. — ♀; *P. oaxes*, Cuba; *P. lugubris*, Venezuela.

Pronophila. Hewitson (Tr. E. Soc. pp. 157, 158) describes *P. praxitheia*, *P. pelina*, *P. phædra*, *P. pœania*, Ecuador.

Taygetis. Butler describes the following new species :—*T. xantippe* (= *T. chelys*, auct. nec Fabr.), Cat. Lep. Fabr. p. 11, Cist. Ent. ii. p. 17, Brazil; *T. ophelia*, l. c. p. 18, hab. — ♀; *T. leuctra*, l. c. p. 19, hab. — ♀; *T. jimna*, Lepid. Exot. iii. p. 17, pl. 7. f. 5, Panama; *T. zippora*, l. c. f. 2, Cayenne; *T. xenana*, l. c. p. 18, f. 3, Cayenne; *T. uzza*, l. c. f. 1, San Geronimo; *T. kezza*, l. c. p. 19, f. 4, Cayenne; *T. zimri*, l. c. f. 6.

Taygetis cecilia, Boisd. Léop. Guat. p. 62, Guatemala.

Corades fluminalis, Butl. Cist. Ent. ii. p. 26, hab. — ♀; *C. laminata*, Butl. l. c. p. 27, Bogotá.

Eurytelides.

BUTLER (Cat. Lep. Fabr. pp. 38, 39) states that *Melanitis dusara*, Horsf.,

= *Elymnias panthera*, Fabr. sp. (outline figure l. c. pl. 2. fig. 7), and that there are probably two species confounded under the name of *E. phegea*, Fabr. He also (Tr. E. Soc. 1870, p. 488) describes *E. casiphona*, Hübn., ♀.

KIRBY (Tr. E. Soc. 1870, p. 147) doubtfully refers *Pap. hypermnestra*, Linn., to *Elymnias undularis*, Dru.; and *Pap. nesæa*, Linn., to *El. lais*, Fabr.

Hypanis ilithyia, Drury. Trimen publishes remarks on this genus and species, Tr. E. Soc. 1870, pp. 358, 359.

Erycinides.

BUTLER remarks (Cat. Lep. Fab. pp. 185-158) that *Emesis drupadi*, Horst., = *Abisara haquimus*, Fabr.; *Pap. coriolanus*, Fabr., = *Pap. odin*, Fabr., = *Ab. echerius*, Stoll; *Eurybia upis*, Hübn., = *Pap. dardus*, Fabr., but is not = *Pap. lamia*, Cram.; *Pap. constantius*, Fabr., is probably a *Eurybia*; *Pap. menippus*, Fabr., prob. = *Mesosemia sifia*, Boisd.; *Mes. myonia*, Hew., prob. = *Pap. cræsus*, ♀, Fabr.; *Mes. tenera*, Westw., is the Venezuelan form of *Pap. tullius*, Fabr.; *Pap. telechus*, Stoll, is not = *Eurygona gemellus*, Fabr.; *Lymnas melantho*, Ménétr., = *Pap. electron*, Fabr., = *Pap. jarbas*, Fabr.; *Zeonia xantippe*, Gray, prob. = *Pap. licursis* (but not *licarsis*), Fabr.; *Pap. florus*, Fabr., is a *Mesene*; *Lemonias cæcina*, Feld., prob. = *Charis flegia*, Fabr.; *Nymphidium nicaste*, Herr.-Schäff., = *Metacharis lucius*, Fabr.; *Lemonias nepia*, Hew., = *Pap. lucianus* ♀, Fabr.; *Pap. zachæus*, Fabr., = race of *Apodemia epulus*, Cram.; *Desmozona hemixanthe*, Feld., = *Calospila emulius*, Fabr.; *Crenna orpheus*, Hew., = *Anatole nepos*, Fabr.; *Orimba cataleuca*, Herr.-Schäff., = *Pap. bias*, Fabr., = *Aricoris epitus*, Cram.

The following known species of this family are described by Boisduval, Léop. Guat. pp. 18-26:—*Erycina inca*, Saund.; *Eurybia lycisca*, D. & H.; *Diophthalma vestalis*, Bates; *Hades noctula*, Westw. He remarks on several other known species, and proposes the name *Nelone* for typical *Emesis*, Fabr. He suggests that *Desmozona belise*, Cram., and *Molela*, Hew., may form a separate genus.

Mesosemia. Hewitson (Exot. Butt. 74, pls. 9, 10) figures the following known species:—*M. marsena*, *M. marsidia*, *M. reba*, *M. zorea*, *M. latifasciata*, *M. loruhama*, *M. ama*, *M. adida*, *M. mehida*, *M. zikla*, *M. ozora*.

Eurygona. Hewitson (Exot. Butt. 76, pl. 9) figures the following known species:—*E. erythræa*, *E. effima*, *E. bettina*, *E. onorata*, *E. præclara*, *E. athena*.

Necyria jutrana, Hew. Figured by Hewitson, Exot. Butt. 75, *Erycina* and *Necyria*, f. 7.

HEWITSON (Equat. Lep. pp. 55-58) describes four new genera of *Erycinidæ*, each founded on a single new species from Ecuador, at too great length to allow of their characters being here repeated:—*Lucilla*, type *L. camissa*, sp. n., l. c. p. 55; *Imelda*, type *I. glaucosmia*, l. c. p. 56; *Compsoteria*, type *C. cascella*, l. c. p. 57; *Threnodes**, type *T. cænoides*, l. c. p. 58. They are all figured (Exot. Butt. 75, pl. 2.)

Calephilis, g. n., Grote & Robinson, Tr. Am. Ent. Soc. ii. p. 310. Type *Pap. cæneus*, Linn. Allied to *Charis*; eyes naked.

* Preoccupied in *Pyralidæ*.

New species :—

Abisara thiusto, *A. zemara*, Butl. Ann. N. H. (4) v. p. 363, Sarawak.

Mesosemia. Hewitson (Tr. E. Soc. 1870, pp. 159–161) describes the following new species from Ecuador:—*M. mancia*, *M. mamilla*, *M. mycene*, *M. mustela*, *M. messala*.

Eurygona elmira, Hewitson, Ent. M. M. vi. p. 226; *E. labiena*, Hew. l. c., Ex. Butt. 76, Oct. 1870, Eur. pl. 9. f. 88: both from Ecuador.

Lymnas jesse, Butler, Ann. N. H. (4) v. p. 303, Lepid. Exot. v. p. 39, pl. 14. f. 8, Venezuela; *L. hodia*, Butl. Cist. Ent. ii. p. 32, Venezuela; *L. ? bryaris*, Hew. Ent. M. M. vi. pp. 227, Chontales.

Lymnas alena, Hew. Exot. Butt. 75, July 1870, *Erycinidæ*, pl. 2. f. 13, Rio Janeiro; *L. passiena*, Hew. l. c. f. 14, New Granada; *L. cratia*, Hew. l. c. f. 15, hab. —?

Lyropteryx olivia, Butl. Ann. N. H. (4) v. p. 364, Lepid. Exot. v. p. 39, pl. 14. f. 2, hab. —?

Hades hecamede, Hew. Exot. Butt. 75, *Erycinidæ*, f. 1–3, Ecuador.

Necyria beltiana, Hew. Ent. M. M. vii. p. 3, Exot. Butt. 75, *Erycina* and *Necyria*, f. 5, 6, Nicaragua.

Erycina pulchra, *E. formosa*, *E. formosissima*, Ecuador, Hew. Eq. Lep. p. 49 (fig. in Exot. Butt. 75, *Eryc.* & *Necyria*, f. 1–4). *E. zinna*, Nicaragua, Columbia; *E. erigone*, Honduras, Mexico; *E. lais*, New Granada: Boisd. Léop. Guat. f. 19, 20.

Ithomeis eulema, Hew. Exot. Butt. 75, pl. 2. f. 1, Columbia.

Comptoseria callizena, Hew. Tr. E. Soc. 1870, p. 162, *C. celtilla*, Hew. l. c., both from Ecuador; *C. cephalena* (*cehalena* in plate), Hew. Ex. Butt. 75, *Erycinidæ*, pl. 2. fig. 2, Cayenne.

Chamælinnas villagomes, Hew. Tr. E. Soc. 1870, p. 163; *C. phœnias*, Hew. Equat. Lep. p. 54: both from Ecuador.

Esthemopsis colazes, Hew. Equat. Lep. p. 54, Ecuador.

Emesis zela, Butler, Ann. N. H. (4) v. p. 364, Lep. Exot. v. p. 40, pl. 14. f. 7, Venezuela, Mexico; *E. angularis*, Hew. Tr. E. Soc. 1870, p. 162, Ecuador; *E. cilix*, Hew. Equat. Lep. p. 50, Ecuador; *E. lacrimæ*, Hew. Ent. M. M. vii. p. 5, Chontales.

Nelone aurimna, Boisd. Léop. Guat. p. 24, Guatemala.

Symmachia. Hewitson describes the following new species:—*S. titiana*, *S. asclepia*, Equat. Lep. p. 51, *S. temesa*, l. c. p. 52, Ecuador; *S. leena*, Ent. M. M. vi. p. 226, *S. threissa*, l. c. p. 227, *S. cleonyma*, l. c. vii. p. 4, Chontales.

Mesene oriens, Butl. Cist. Ent. ii. p. 31, Venezuela; *M. xypete*, Hew. Ent. M. M. vi. p. 227, Chontales; *M. hewitsonii*, *simbla*, and *niciades*, Boisd. Léop. Guat. p. 22, *M. macularia*, Boisd. l. c., Guatemala and Honduras.

Charis libna, Butler, Ann. N. H. (4) v. p. 364, Lep. Exot. v. p. 40, pl. 14. f. 1, Mexico?; *C. victrix*, Hew. Equat. Lep. p. 50, Ecuador.

Bæotis quadrinota, Butl. Cist. Ent. ii. p. 32, Rio.

Lemonias. Hewitson (Eq. Lep. pp. 52, 53) describes *L. amphis*, *L. amasis*, *L. densenaculata*, *L. luceres*, Ecuador; *L. lasthenes*, Ent. M. M. vii. p. 5, Chontales.

Hypophylla umbra, Boisd. Léop. Guat. p. 23, Honduras.

Nymphidium lilina, Butl. Ent. M. M. vi. p. 252, pl. 1. f. 8, Mexico; *N.*

ethelinda, Hew. *op. cit.* vii. p. 6, Minas Geraes; *Desmozona ascolides*, Boisd. Lép. Guat. p. 21, Guatemala.

Pandemos palaeste, Hew. Exot. Butt. 75, *Erycinidae*, f. 7, 8, New Granada.

Aricoris jansoni, Butl. Cist. Ent. ii. p. 31, Lep. Exot. v. p. 41, pl. 14. f. 5, Chontales; *A. cleomedes*, Hew. Ent. M. M. vii. p. 4, Chontales.

Uraneis ucubis, Hew. Ex. Butt. 75, *Erycinidae*, f. 4, Pará.

Stalactis evelina, Butler, Ann. N. H. (4) v. p. 365, Lep. Exot. v. p. 41, pl. 14. f. 6, hab. —?

Lycenides.

BUTLER states (Cat. Lep. Fabr. pp. 158–199) that *Pap. honorius*, Fabr., is an *Epitola*; *Pithecopis hylax*, Fabr., is distinct from *hylax* of Donovan and Doubleday; *Hesp. catilina*, Fabr., is not = *Lycæna archias*, Cram.; *Pap. damoëtes*, Fabr., = *Lyc. bæticus*, Linn., var.; *Lycæna kandarpa*, Horst., = *Pap. strabo*, Fab.; *Pap. silvius*, Fabr., = *Thestor protumnus*, Linn., var.; *Lycæna delegorguet*, Boisd., prob. = *Pap. laches*, Fabr., = *Thestor bibulus*, Fabr.; *Pap. amyntor*, Herbst, = *Deudorix eryx*, Linn.; *Deudorix varuna*, Hew. (nec Horsf.), = *Pap. sphinx*, Fabr. (nec Hübn.); *Hypolycæna rabe*, Hew. (an Boisd. ?), = *Hesp. phidius*, Fabr.; *Pap. sichæus*, Cram., = *Bithys strephon*, Fabr., but not = *Pap. cyllarus*, Cram.; *Strymon mopsus*, Hübn., = *Hesp. titus*, Fabr.; *Brangas thrasyllus*, Hübn., = *Hesp. thales*, Fabr. Butler also (*l. c.* pl. 2) figures the following species of this family which have been described by Fabricius:—*Lampides plato*, *L. juba*, *Tmolus cleon*, *T. sophocles*, *T. moncus*, *Lycæna otis*.

Myrina timon, Fabr. Figured by Butler, Lep. Exot. v. pl. 14. f. 3, 4.

Aphnæus caffer. Trimen remarks on this species, Tr. E. Soc. 1870; pp. 368, 369.

Thecla betulae. Larva described by Newman, Ent. v. pp. 137, 138.

Thecla inorata, G. & R., and *T. falacer*, Godt. Grote gives the synonymy of these species as follows:—1. *inorata*, G. & R., and Saund., = *falacer*, Boisd. & Lec., plate; 2. *falacer*, Godt., Boisd. & Lec. (text, p.), Harr., = *edwardsii*, G. & R., = *calanus*, Hübn. Canad. Ent. ii. p. 165–168. Saunders describes the larva, *op. cit.* pp. 61–64.

Thecla calanus. Scudder (P. Bost. Soc. xiii. pp. 272–276) gives the synonymy of this species and *T. edwardsii*, sp. n., as follows:—*T. calanus*, Hübn., = *falacer*, Godt., = *inorata*, Grote & Rob.; *T. edwardsii*, Saund. MS., = *falacer*, Harr., Scudd. p., = *calanus*, Grote & Rob.

Thecla abdominalis. Lederer seems inclined to regard this insect as hardly distinct from *T. acaciæ*, Ann. E. Belg. xiii. p. 24.

Thecla aufidena, Hew., = *bathis*, Godt., = *battus*, Cram.: Boisd. Lép. Guat. p. 15.

Zeritis. Trimen (Tr. E. Soc. 1870, pp. 370–377) publishes notes on the following known species of this genus:—*Z. chrysaor*, Trim.; *Z. thysbe*, Linn.; race *palmus*, Cram.; *Z. thyra*, Linn. (*Chrysorychia thyra*, Wallengr., probably = *Z. chrysaor*, ♀); *Z. pierus*, Cram. (= *Pap. suetoni*, Fabr., = *Nais almeida*, Feld.: the latter insect is quite distinct from *Z. nyctus*, Cram.); *Z. aranda*, Wallengr.; *Z. leroma*, Wallengr.; and *Z. basuta*, Wallengr.: *Z. leroma* is figured *l. c.* pl. 6. f. 10.

Polyommatus alciphron, Rott. Greek specimens are intermediate between this species and *P. gordius*, Esp. [Sulz.]. Staudinger, Hor. Ent. Ross. vii. 1870. [VOL. VII.]

pp. 45, 46.—*P. phleas*, L., and *P. eleus*, Fab., vary in a precisely similar manner. Staud. l. c. pp. 46, 47.

Polyommatus phleas. A white variety is recorded by G. T. Porritt, Ent. M. M. vii. p. 110.

Polyommatus epixanthe. Described in full by Möschler, S. E. Z. 1870, pp. 114, 115.

Polyommatus helle. Habits and transformations fully described by Zeller, S. E. Z. 1870, pp. 299–304.

Polyommatus thersamon, var. *persica*, Bienert, Lep. Ergebn. pp. 28, 29.

Chrysophanus orus, Cram., and *C. lara*, Linn. Trimen remarks on these two species (Tr. E. Soc. 1870, pp. 369, 370). He considers *C. lara* to be a true *Chrysophanus*.

Lycæna. *Pap. barbarus*, Gmel., = *Pap. pirithous*, Linn., which is probably the ♂ of *Pap. philiasus*, Linn. (? = *Polyommatus amyntas*, Fabr.). Kirby, Tr. E. Soc. 1870, pp. 149, 150.

TRIMEN (Tr. E. Soc. 1870, pp. 359–368) publishes remarks on several South-African species of this genus, especially *L. palemon*, Cram., *L. asteris*, Godt., *L. trochilus*, Herr.-Schäff., *L. mahallokoæna*, Wallengr., and *L. gaika*, Trim. He figures *L. mahallokoæna*, pl. 6. figs. 7, 8, and notes *L. knysna*, Trim., as = *L. lysimon*, Ochs.

Lycæna arsacia, Led. Lederer now regards this species as distinct from *panagæa*, H.-S.: Hor. Ent. Ross. viii. p. 9.

Lycæna hypochiona, Ramb., = *argiades*, Esp., = *ægon*, var., unless the first = *calliopis*, Boisd., which appears to be distinct from *argus*. Guénée, Ann. Soc. Ent. Fr. (4) x. pp. 20, 21. He also remarks (l. c. note) on the variations of *L. argus* and *E. ægon*.

Lycæna hesperica, Ramb., = *L. zephyrus*, Friv.; *L. pylaon*, Ev., may be another local form. Staudinger, Hor. Ent. Ross. vii. pp. 48–50.

Lycæna bætica and *L. argiolus*. On a singular organ in the larvæ see Guénée and Goossens, Ann. Soc. Ent. Fr. x. pp. lxxvii, lxxviii.

Lycæna alexis. A. Müller mentions having seen a specimen fly towards a small piece of blue paper: Ent. M. M. vii. pp. 61, 62. Bienert describes *L. icarus*, var. *persica*: Lep. Ergebn. p. 29.

Lycæna pseudargiolus, Boisd. (= *argiolus*, Abb. & Smith, = *neglecta*, Harr., text not plate), described and figured by Edwards, Butt. N. Amer. *Lyc.* pl. 2. f. 1–3; *L. neglecta*, Edw. (= *pseudargiolus*, Harr. text), figured and described by Edwards, with notice of the larva from Saunders's observations, l. c. f. 4–6.

Lycæna semiargus, Rott. Staudinger describes var. *parnassia*, and states that *L. helena*, Staud., and *L. antiochena*, Led., are also local forms of the same species. Hor. Ent. Ross. vii. pp. 55, 56.

Lycæna corydon. Lederer points out the distinctions between vars. *caucasica* (*polona*, Led. olim, nec Zell.) and *corydonius*: Ann. E. Belg. xiii. p. 23. Newman describes the larva: Ent. v. pp. 138, 139.

Lycæna arion. Eggs and young larva described by Merrin and Newman: l. c. pp. 139, 140, 167, 168.

Lycæna battus. A variety from East Siberia noticed by Erschoff, Bull. Mosc. 1869, pt. 4. p. 272.

Lycæna panoptes, Hübn., is not distinct from *L. hylas*, W. V.: Staudinger, Hor. Ent. Ross. vii. pp. 50, 51.

Lycæna medon, Hübn. Staudinger describes vars. *æstiva*, *meridionalis*, and *alpina*: l. c. p. 52.

BOISDUVAL (Lép. Guat. p. 14) proposes the generic names *Eucharia* (type *E. ganymedes*, Cram.) for *Evenus*, Hübn.; and *Artipe* (type *A. amyntor*, Herbst.) for *Deudorix*, Hew. *Eucharia* is briefly characterized: *mæcenus*, Fabr., and *timoleon*, Stoll, placed by Hewitson in *Deudorix*, he refers to *Amblypodia* (true) as distinguished from *Arhopala*.

Fenisea, g. n., Grote. Allied to *Thecla favonius*. Type *Hesperia tarquinius*, Fab. Characterized at great length, Tr. Am. Ent. Soc. ii. pp. 307, 308.

New species:—

Eumenia godartii, Boisd. (= *tozea*, Godt. ?), Lép. Guat. p. 13, Guatemala; *E. toxana*, Boisd. l. c., Costa Rica.

Iolus tajoraca, Walker, Ent. v. p. 51, Red Sea.

Aphnæus tamaniba, Walk. l. c., Red Sea.

Thecla. Hewitson (Equat. Lep. pp. 59–68) describes 18 species from Ecuador:—*T. timoclea*, *T. atymna*, *T. elongata*, *T. theia*, *T. gaina*, *T. epopea*, *T. cleocha*, *T. gabatha*, *T. trebonia*, *T. cartea*, *T. cordelia*, *T. thespia*, *T. beera*, *T. bosora*, *T. camissa*, *T. calesia*, *T. arria*, *T. oxida*.

Thecla behrri, Edw. Tr. Am. Ent. Soc. iii. p. 18, California; *T. tetra*, (Behr, MS.), Edw. l. c. p. 19, hab. — ?; *T. dryope*, Edw. l. c., Colorado; *T. edwardsii* (Saund. MS.), Scudd. P. Bost. Soc. xiii. p. 276, Eastern N. America; *T. souhegan*, Whitney, op. cit. p. 162, Milford, N. H.; *T. gauna*, Boisd. Lép. Guat. p. 16, Costa Rica.

Zeritis molomo, Trimen, Tr. E. Soc. 1870, p. 373, pl. 6. f. 9, Basuto-land.

Polyommatus lampon, *P. phænicurus*, Astrabad: Lederer, Hor. Ent. Ross. viii. p. 8, pl. 1. f. 2–5.

Chrysophanus cupreus, Oregon; *C. hermes*, California; *C. virginienensis*, Nevada: Edw. Tr. Am. Ent. Soc. iii. pp. 20, 21.

Pithecopis zalmora, Butler (= *P. hylax*, Doubl. nec Fabr. nec Don.), Cat. Lep. Fabr. p. 161, hab. — ?

Lampides. Walker (Ent. v. pp. 52–54) describes *L. uranicola* and *L. ferrana*, Arabia; *L. ethoda*, Cairo; *L. agave*, *L. olympusa*, *L. lyce*, *L. bura*, *L. pandama*, Red Sea; *L. neis*, Arabia.

Lycæna letsea, *L. macalenga*, Trim. Tr. E. Soc. pp. 362–364, pl. vi. f. 3–5, Basuto-land. *L. cassioides* (= *Pol. pirithous*, Godt. nec Linn.), Honduras and Mexico; *L. cassidula*, Honduras; *L. nyagora*, *L. gozora*, Honduras and Mexico: Boisd. Lép. Guat. p. 16. *L. cleodora*, Egypt, Arabia; *L. samia*, Red Sea; *L. itea*, Cairo: Walk. Ent. v. pp. 54, 55. *L. glaucias*, *L. marcida*, Astrabad: Lederer, Hor. Ent. Ross. viii. p. 10, pl. 1. f. 6–8. *L. kodiak*, Edw., Tr. Am. Ent. Soc. iii. p. 20, Kodiak; *L. fortunata*, Staud. B. E. Z. 1870, p. 99, Teneriffe; *L. isaurica*, Staud. l. c. p. 327, Asia Minor.

Hesperiides.

BUTLER (Ent. M. M. vii. pp. 55–58, 92–99) has published a revision of the genera of *Hesperiide*, adding a list of the species referable to each genus which are contained in the collection of the British Museum. Some new genera are characterized, and it cannot be doubted that the study of the group will receive a great impetus from this important paper. Butler regards *Ismene*, Swains., as typical *Hesperia*, Fabr.; *Carterocephalus*, a name under

which Lederer separated *paniscus* and *sylvius* from typical *Cyclopidides*, is inadvertently applied to *C. exornatus*, Feld., and allies.

BUTLER states (Cat. Lep. Fabr. pp. 259-287) that *Hesp. pandia*, Moore, = *Telegonus thyrsis*, Fabr.; *Tamyrus laonome*, Swains., = *Hesp. amiatius* = *Pyrrhopyga amychus*, Cram.; *Pap. ladon*, Cram., = *Hesp. exclamacionis*, Fabr., var.; *Cobalus philemon*, Fabr., is distinct from *Pap. arcas*, Dru., and *Pap. flyas*, Cram. Valuable notes, too numerous to notice in detail, are attached to almost every species of this family described by Fabricius; and the following species are figured (l. c. pls. 2 & 3):—*Cyclopidides maro*, *Epargyreus nero*, *E. mathias*, *Pamphila taumas*, *P. phocion*, *Hesperia alexis*, *H. exclamacionis*, *Cobalus remus*, *C. saturnus*, *C. philemon*, *C. pygmaeus*, *Telegonus lucas*, *Tagiades clito*, *Proteides coridon*, *Hesperilla gremius*, *Taractrocera mævius*, *Ceratrachia phocion*, *C. nothus*.

TRIMEN (Tr. E. Soc. 1870, pp. 385-390) publishes the following remarks on South-African species of this family:—*Pyrgus diomus*, Hopff., is distinct from *vindex*, Cram.; *Cyclopidides syrinx* and *Pamphila niveostriga*, Trim., ♀ described; *Rhopalocampa valmora*, Wallengr., = *Ismene pisistratus*, Fabr.; *florestan*, Cram., is distinct.

BUTLER describes in full the following species of *Hesperide* briefly characterized by Herrich-Schäffer:—*Goniuris cenis*, Tr. E. Soc. 1870, p. 493, hab. — ?; *Telegonus cepio*, p. 494, *T. latus*, p. 495, both from Venezuela.

MINOT describes the male of *Hesperia metea*, Scudd., and remarks that *H. pocahontas* and *H. quadraguina*, Scudd., are identical. P. Bost. Soc. xii. pp. 319, 320.

Nisoniades. Scudder and Burgess (*op. cit.* xiii. pp. 282-306) describe and figure the asymmetrical male organs of the following known N. American species:—*N. persius*, *N. brizo*, *N. martialis*, *N. juvenalis*, *N. tristis*. Asymmetry also exists in *Achlyodes*. *N. costalis*, Westw., probably = *N. juvenalis*. *N. Therminieri* and *N. catullus* are probably not true *Nisoniades*. Several new species are also characterized by descriptions of the male organs; but nothing is said of the characters of the females.

Thanaos tages. Larva described by Buckler, Ent. M. M. vi. pp. 233, 234.

Syrichthus orbifer, Hübn. Staudinger attempts to clear up the synonymy of this species and its allies. Hor. Ent. Ross. vii. pp. 84-86.

Pamphila derasa, Hew. Herrich-Schäffer describes the supposed ♀. CB. Regensb. 1870, p. 159.

Pamphilinæ, subfam. nov. Includes "all the genera having a short thick club of the *Pamphila* type to the antennæ, and terminating at a right angle in a short pointed hook, such as *Proteides*, *Carystus*, *Pamphila*." Butler, P. Z. S. 1870, p. 728.

Ceratrachia, g. n., Butler, Cat. Lep. Fabr. p. 274. Allied to *Carystus* and *Cobalus*, but less robust, wings narrower, hind wings subpyriform, body more slender, but head very large, eyes prominent, antennæ longer, ending in an obsolete hook; hind wings beneath with a circular series of subhyaline spots. Type *Pap. nothus*, Fabr.

Taractrocera, g. n., Butler, l. c. p. 279. Allied to *Pyrgus*; wings narrower, palpi erect, antennæ shorter, with a distinct argynniform club. Type *Hesp. mævius*, Fabr.

Spathilepia, g. n., Butler, Ent. M. M. vii. p. 57. Antennæ as in *Eudamus*, wings shaped nearly as in *Telegonus*, but front wings always more or less

angulated below apex; anal angle of hind wings clothed with long radiating spatulate scales in place of ordinary fringe. Type *Pap. clonius*, Cram.

Udranomia, g. n., vel *Hydrænomia*, Butler, l. c. pp. 58, 99. Allied to *Phanus*, but shorter and more compact; antennæ as in *Pamphila*. Type *Eudamus orcinus*, Feld.

Plastingia, g. n., Butler, l. c. p. 95. Allied to *Astictopterus*, form and build of *Pamphila*; palpi with last joint prominent, antennæ much elongated, terminating in a gradually curved whip-like hook. Type *Hesp. flavescens*, Feld.

Pardaleodes, g. n., Butler, l. c. p. 96. Antennæ much more elongated and suddenly hooked than in *Cyclopides*; palpi shorter and less hairy; discoidal cell of front wings broader than in *Pamphila*; first subcostal branch emitted nearly in a straight line with origin of first median; branches of subcostal wider apart; lower discocellular shorter. Type *Pap. edipus*, Cram.

Typhedanus, g. n., Butler, Tr. E. Soc. 1870, p. 497. Allied to *Spathilepia*; form and palpi as in *Telegonus*, but anal angle of hind wings terminating in long hair-scales; antennæ as in *Carystus*, but shorter; males with a very prominent radiating brush of bristles from inner margin of hind wings. Type *T. zephus*, sp. n., l. c., Venezuela.

Cogia, g. n., Butler, l. c. p. 508. Antennæ as in *Typhedanus*; palpi more closely scaled than in *Pamphila*; form of wings as in *Pyrigus*, fringe long; males with a brush of long radiating bristles on the abdominal margin near base of hind wings; hind legs with 4 long spurs. Type *C. hassan*, sp. n., l. c., Santarem.

Pellicia, g. n., Herr.-Schäff., CB. Ver. Regensb. 1870, p. 159 (? = *Apaustus*, Butl.). ♂ with a pencil of hair on the upperside of hind wings against the angle of cell 7, and indicated on the underside by a raised swelling on the angle of cell 7. The following 7 species are described as new (l. c. p. 160):—*P. macarius*, Venezuela, Surinam; *P. albangula*, Guatemala; *P. ephora*, Nicaragua and Brazil; *P. chlorocephala*, S. America; *P. dimidiata*, Mexico; *P. crispus*, Venezuela; *P. costimacula*, Venezuela.

New species:—

Goniuris lindora, hab. —?; *G. hirtius*, Venezuela; *G. jethira*, Peru; *G. corydon*, Cuba. Butl. Tr. E. Soc. pp. 491, 492.

Eudamus pylades (= *E. bathyllus*, Harr. nec Abb. & Smith), Scudder, P. Bost. Soc. xiii. p. 170, Massachusetts.

Eudamus cynapes, *E. centrites*, Hew. Eq. Lep. pp. 74, 75, Ecuador; *E. epigena*, Butl. Tr. E. Soc. 1870, p. 493, Mexico.

Telegonus egregius, Butl. l. c. p. 494, hab. —?

Æthilla epicra, *Æ. echina*, Hew. Equat. Lep. p. 70, Ecuador; *Æ. memmius*, Venezuela; *Æ. coracina*, Ipaunema; *Æ. jariba*, Cuba; *Æ. jaira*, West Indies: Butl. Tr. E. Soc. pp. 495, 496.

Spathilepia evelinda, Butl. l. c. p. 496, Brazil.

Hesperia onara, East Indies; *H. hurama*, Cape York, Champion Bay, and Aru Islands; *H. vitta*, Sarawak, Butl. l. c. p. 498. *H. hayhurstii*, Edw. Tr. Am. Ent. Soc. iii. p. 22, Missouri.

Pyrrhopyga spatiosa, *P. arathyrea*, Hew. Equat. Lep. p. 69, Ecuador; *P. jamina*, Butl. l. c., hab. —?

Erycides yokkara, Butl. l. c. p. 500, Peru.

Proteides xarippe, hab. —?; *P. othna*, Venezuela; *P. fiara*, Kaffraria: Butl. l. c. pp. 502, 503.

Carystus. Butler (l. c. pp. 500–502) describes *C. ozota*, Venezuela; *C. jabeza*, Tocantins; *C. jeconia*, Venezuela; *C. canente*, hab. —?; *C. obeda*, Venezuela; *C. ladana*, Borneo.

Pamphila. Butler (l. c. pp. 504–506) describes *P. ulama*, New Holland; *P. hala*, Venezuela; *P. kedema*, hab. —?; *P. vira*, Pará; *P. lotana*, Tocantins; *P. chrysogastra*, Venezuela, Santa Marta; *P. kenava*, Venezuela.

Pamphila proclea, Walker, Ent. v. p. 56, Cairo; *P. subcostulata*, *P. columbaria*, Herr.-Schäff. CB. Ver. Regensb. 1870, p. 159, Brazil; *P. simplicissima*, Herr.-Schäff. l. c., Venezuela.

Phlebodes unia, St. Domingo; *P. virgo*, Pará; *P. koza*, Capim; *P. ittona*, Venezuela: Butl. l. c. pp. 507, 508.

Hesperia. Hewitson (Eq. Lep. pp. 71–74) describes *H. theoclea*, *H. hermesia*, *H. hermoda*, *H. carmenta*, *H. albofimbriata*, *H. variegata*, *H. hesia*, *H. boeta*, Ecuador.

Hesperia powesheik, Parker, Amer. Ent. ii. p. 271, Iowa.

Augiades despecta, Butl. l. c. p. 497, Pará; *A. lemna*, hab. —?

Apantus ira, Butl. l. c. p. 508, hab. —?

Pelopidas [n. g. ?] *midas*, Walk. Ent. v. p. 56, Cairo.

Pyrgus mafa, Trimen, Tr. E. Soc. 1870, p. 386, Basuto-land; *P. omrina*, Peru; *P. leca*, Venezuela; *P. figara*, hab. —? : Butl. l. c. pp. 509, 510.

Leucochitonea flavofasciata, *L. thoria*, *L. thestia*, *L. laoma*, Hew. Eq. Lep. pp. 76, 77, Ecuador; *L. paradisea*, Butl. l. c. p. 499, Port Natal.

Asictopteris xanites, Butl. l. c. p. 510, Sarawak.

Plastingia helena, *P. hieroglyphica*, Butl. l. c. p. 511, Sarawak.

Cyclopides tsita, Trimen, l. c. p. 386, pl. 6. f. 13, Basuto-land; *C. argenteogutta*, Butler, l. c. p. 512, Nubia; *C. phidyle*, Walk. l. c. p. 56, Red Sea.

Carterocephalus hilina, Butl. l. c. p. 512, Venezuela.

Pithonides gladiator, Pará, Tapajos; *P. jabeza*, Venezuela: Butl. l. c. pp. 512, 513.

Nisoniades. Scudder and Burgess (P. Bost. Soc. xiii. pp. 287–304, figs. 2–16) describe and figure the male organs of the following new species:—*N. lucilius* (Lintn. MS.), *N. icelus* (Lintn. MS.), New England; *N. terentius*, Florida; *N. funeralis*, Texas; *N. ovidius*, Florida; *N. ennius*, New England; *N. propertius*, California; *N. tibullus*, California; *X. horatius*, New England, Texas; *N. virgilius*, New England; *N. plantus*, Florida.

Thanaos ibhara, Butl. l. c. p. 513, Venezuela.

Nisoniades doris, Walker, l. c. v. p. 56, Red Sea.

Achlyodes. Butler, l. c. pp. 514–518, describes *A. zera*, Venezuela; *A. rossine*, Rio Janeiro; *A. ozotes*, Venezuela, Bogotá, Bolivia; *A. ozema*, Nicaragua, Honduras, St. Paulo, Tapajos; *A. zephus*, Venezuela, Columbia; *A. leada*, *A. ophia*, Venezuela; *A. hadina*, Brazil; *A. odina*, Venezuela.

Helias pedaliodina, *H. diurna*, hab. —?; *H. ithrana*, Peru, Rio Janeiro, Ega: Butl. l. c. pp. 518, 519.

Tagiades janetta, Butl. l. c. p. 519, Aru.

Perygospidea truncata, Hew. Equat. Lep. p. 75, Ecuador.

HETEROCERA.

WELJENBURGH publishes some observations on parthenogenesis in various species, more especially in *Liparis dispar*, which he found could be reproduced by parthenogenesis for two generations; but the third brood of unfertilized eggs dried up. He gives a list of the various species in which parthenogenesis has been observed. Arch. Néerl. v. pp. 258-264.

A larva from Monte Video, profusely covered with hairs or bristles having clavate tips, was exhibited by F. Smith at one of the meetings of the Entomological Society. He thought it was the caterpillar of a moth, and remarked that Horsfield had described the larva of *Lymantria* as having a somewhat similar covering. R. M'Lachlan added that the larva of *Acronycta alni* possessed some hairs of the same shape, though few in number. Pr. E. Soc. 1870, p. 14.

PACKARD (Amer. Nat. iv. p. 229, pl. 2) figures the transformations of the following N. American *Heterocera*, from unpublished drawings by Abbot:—*Eustixis pupula*, Hübn.; *Cælodasys biguttatus*, Pack.; *Dryopteris*, sp.; *Acontia metallica*, Grote; *Homoptera edusa*, Dru.; *Hyperetis*, *Boarmia*, *Acidalia*, *Herminia*, *Helia*, *Geometra*, spp.; *Botys*, 2 spp.

PRITZWITZ (S. E. Z. 1870) publishes a plate illustrative of his paper in 1868. The species of *Heterocera* represented are:—f. 1, *Notodonta velitaria*, ♀ aberr.; f. 2, *Leucania pallens*, larva; f. 3, *Bomb. bicolora*, Cram., body; f. 4, *B. aulica*, ♂ aberr.; f. 5, *B. melaxantha*, Hübn., body; f. 6, 7, *B. villica*, ♀ aberr.; f. 8, *B. aulica*, ♂ aberr.

Descriptions of the new species of *Lepidoptera* described by Mabille, from Corsica (Ann. Soc. Ent. Fr. 1869, pp. 53-80) are extracted, Bull. Ent. Ital. 1870, pp. 60-63.

A list of the new *Microlepidoptera* described by Nowicki in 1864 is published in S. E. Z. pp. 427, 428.

On the American moth-trap, see Ent. v. pp. 61, 62, 82, 83, 115, 116.

SPHINGIDÆ.

STEFANELLI has published another instalment of his catalogue of the *Lepidoptera* of Tuscany, containing the Sphinges. Bull. Ent. Ital. ii. pp. 339-357.

MAASSEN questions the possibility of the large *Sphingidæ* being able to cross the Atlantic ocean by flight, as supposed by Koch. S. E. Z. 1870, p. 56.

Sesia diffinis, Boisd. Larva described by Mead, Canad. Ent. ii. pp. 157, 158.

Thyreus abbotii, Sw. Transformations described and larva and imago figured, Amer. Ent. ii. p. 123.

BOISDUVAL describes (Lép. Guat.) *Perigonia lusca*, Fabr. (p. 67), and *Chærocampa crotomis*, Walk. (p. 70); the latter as new.

Chærocampa elpenor. A variety is described by E. F. Bishopp, Ent. v. p. 146.

Chærocampa nessus, Cr. Schaufuss describes var. *rubicundus* from Java. Nunq. Ot. i. p. 18.

Deilephila hippophaes. Birchall remarks on the possible occurrence of this species in Ireland. Ent. v. p. 123.

Deilephila livornica. Larva described by G. C. Bignell, A. B. Farn, and

W. Hobbs, Ent. v. pp. 169, 180, 214; also by J. Hellins, from his own and others' observations, Ent. M. M. vii. pp. 99-102.

Deilephila galii. Larva described by Newman, Ent. v. pp. 191, 192; further remarks by W. May, pp. 201, 202. Also described by Buckler, from a number of very variable larvæ: Ent. M. M. vii. pp. 123-127.

Deilephila lineata, F. Figured, with two varieties of larvæ, in Amer. Ent. ii. pp. 257, 258.

Philampelus achemon and *satellitica*. Transformations figured and described, Amer. Ent. ii. pp. 54, 55, 89, 90.

Darapsa versicolor, Harr. Larva feeds on *Cephalanthus occidentalis*, W. H. Edwards, Canad. Ent. ii. p. 134.

Darapsa myron, Cram. Transformations figured and described in Amer. Ent. ii. pp. 22-24.

Pachylia ficus. Schaufuss describes var. *venezuelensis*, Nunq. Ot. i. p. 16.

Sphinx convolvuli. The musky odour emitted by the male proceeds from two lateral points beneath the first segment of the abdomen, which are furnished with tufts of rather long bristles, which can be raised and lowered at pleasure. Bull. Ent. Ital. ii. p. 281.

Acherontia atropos. J. Thorpe publishes notes on breeding this insect. Ent. v. pp. 143, 144.

Smerinthus dyras, Walk., is a misprint for *S. dryas*, and the latter name should be restored to the species. Boisdual and Kirby, Pet. Nouv. no. 29.

Smerinthus tilia is sometimes double-brooded. Ann. Soc. Ent. Fr. x. Séances, p. lxx.

Smerinthus ocellatus. E. H. Todd mentions a specimen passing two years in the pupa state: Ent. M. M. vii. p. 61.—*S. tilia*. A malformation noticed by Fallou, Ann. Soc. Ent. Fr. Séances, 1870, p. 58.

New species:—

Macroglossa gigantea, Venezuela; *M. abboti*, Columbia; *M. doto* et var. *affinis*, Africa and Venezuela [?]; *M. harpyia* (Klug, MS.?), Venezuela; *M. tristis*, China; *M. cuninghami*, Schauf. Nunq. Ot. i. pp. 20-22; *M. corvus*, Boisd. Léop. Guat. p. 66, Nicaragua.

Perigonia caliginosa (Feld. ined.), *P. ilus*, Boisd. l. c. p. 66, Honduras and Mexico.

Aleuron chloroptera, Boisd. l. c. p. 71, Guatemala, Honduras, Para (probably = *Sphinx chloroptera*, Perty).

Ambulyx rostralis (Feld. ined.), Boisd. l. c. p. 68, Nicaragua, New Granada.

Cherocampa aristor, Boisd. l. c. p. 69, Guatemala; *C. fugax*, Boisd. l. c. p. 70, Honduras, Mexico. *C. batschii*, Keferstein, Entom. Notiz. p. 14, f. 4, Madagascar. *C. curvatus*, Cuba; *C. silhetensis*, Silhet; *C. brasiliensis*, Brazil; *C. hortulanus*, Venezuela: Schauf. l. c. pp. 17, 18.

Philampelus cissi, *P. calliomenæ*, Schauf. l. c. p. 19, from Venezuela.

Pachylia kademi, Schauf. l. c. p. 16, S. America.

Zonilia densoi, Keferstein, l. c. p. 14, f. 5, Madagascar.

Sphinx sesquilex (Feld. ined.), Guatemala; *S. merops*, Honduras, Mexico. *S. andromedæ*, Honduras, Oajaca: Boisd. l. c. pp. 73, 74. *S. trojanus*, Venezuela; *S. pseudoconvolvuli*, Port Natal: Schauf. l. c. p. 15.

Anceryx capreolus, Venezuela; *A. piperis*, S. America: Schauf. l. c. pp.

16, 17. *A. rhæbus*, Honduras, Mexico; *A. omphalæ*, Brazil, Nicaragua: Boisd. l. c. p. 72.

Enosanda chinensis, East Indies, Schauf. l. c. p. 23.

Smerinthus decolor, Schauf. l. c. p. 14, Himalaya; *S. populeti*, Bienert, Lep. Ergebn. p. 33, Persia.

ÆGERIIDÆ.

The habits of the American peach-borer are described and the imago figured in Amer. Ent. i. pp. 180, 181.

Sesia stiziformis, H.-S. Lederer figures this species, Ann. E. Belg. xiii. p. 27, pl. 1. f. 6.

Sesia doleriformis, H.-S. On the synonymy of this species and its allies, see Staudinger, Hor. Ent. Ross. vii. pp. 94-96.

Sesia myrmosiformis, H.-S. Staudinger describes var. *cingulata* from Greece, l. c. pp. 99, 100.

New species :—

Sesia umbrifera, Staud. l. c. p. 96, pl. 1. f. 5, Corfu; *S. parthica*, Lederer, Ann. E. Belg. xiii. p. 45, pl. 1. f. 4, 5, Transcaucasia.

Sesia leucoparea, *S. zimmermanni*, Astrabad, Lederer, Hor. Ent. Ross. viii. p. 13, pl. 1. f. 11-14.

URANIIDÆ.

NEWMAN refers the insects of this family to the *Rhopalocera*. Ent. v. pp. 40, 41.

Urania fulgens, Walk. Boisduval redescribes this species as new. Léop. Guat. p. 77.

Coronis ocyllus, sp. n., Boisd. l. c. p. 76, Guatemala, Mexico; *C. ducalis* and *C. ducatrix*, spp. nn., Schauf. Nunq. Ot. i. p. 12, Venezuela.

Nyctalemon longicaudus, sp. n., Schauf. l. c. p. 13, Manilla.

CASTNIIDÆ.

BUTLER states (Cat. Lep. Fabr. p. 291) that *Callidula erycinata*, Walk., = *Pap. thymetus*, Fabr. [This identification must be regarded as somewhat doubtful, as *Pap. thymetus* is considered by some authors to be a *Phyciodes* (see Cat. Fabr. p. 104), and by others to be identical with *Cohas* (*Terias*) *euterpe*, Ménétr.]

Synemon. Newman refers this genus to the *Rhopalocera*. Ent. v. p. 40.

Castnia marcel-serres, Godt. Schaufuss describes the ♀, Nunq. Ot. i. p. 10.

Alypia 8-maculata, F. Transformations described and larva and imago figured, Amer. Ent. ii. pp. 150-152.

New species :—

Castnia ctesiphon, *C. penelope*, *C. boisduvali*, *C. albofasciata*, Brazil, Schauf. l. c. pp. 8, 9; *C. diva*, Butler, Lep. Exot. vi. p. 46, pl. 17. f. 1, 2, Chontales.

ZYGÆNIDÆ.

Zygæna filipendula. Kirby remarks on the scarcity of this species in the neighbourhood of Hilden and Barmen, in Rhenish Prussia. J. R. Dubl. Soc.

v. p. 442.—J. Hellins suggests that it is occasionally double-brooded in England. Ent. M. M. vi. p. 264.

Zygæna stæchadis, Borkh. Lederer describes and figures a variety from Transcaucasia. Ann. E. Belg. xiii. p. 29, pl. 1. f. 7. He also remarks (*l. c.*) that *Z. filipendulæ* gradually becomes changed into *transalpina*, Hübn. (*nec* Esp.), and *charon*, Boisd. (*nec* Hübn.).

Procris (Acoloitus) americanæ. Transformations described and figured in Amer. Ent. ii. pp. 173, 174, from Rep. Ins. Miss. ii.

Nachia punctata, F. *N. famula* and *N. hyalina* of Freyer, and also *N. servula*, Berce, are forms of this species. Staudinger, Hor. Ent. Ross. vii. pp. 106, 107.

Diptilon, g. n. Prittwitz, S. E. Z. 1870, p. 349. Allied to *Hæmaterion*. Head of moderate size, round; palpi slender, tip pointed, somewhat curved outwards, nearly naked, reaching to the forehead; antennæ with two rows of pectinations not extending to the tips, longest in the middle. Thorax moderately stout. Abdomen with 6–7 segments; segment 3 strongly constricted, last segment with a short tuft. Legs imperfect, those present without spurs. Fore wings forming a half-circle. Cell *1a* strongly rounded towards the body. Hind wings reduced to simple rudiments, not extending beyond segment 3 or 4; coarsely scaled; sickle-shaped towards the abdomen, resting on the inwardly curved point: some coarse moderately long bristles on the edges and on the surface. *D. telamonophorum* (pl. 2. f. 2 *a–d*) and *D. dieides*, spp. nn., *l. c.* p. 350, Rio.

Zygæna pectinicornis, sp. n., Schauf. Nung. Ot. i. p. 11, Port Natal; *Z. haberhaueri*, Lederer, Ann. E. Belg. xiii. p. 45, Transcaucasia.

Glaucopsis tollinii, sp. n., Keferstein, Entom. Notiz. p. 13, f. 3, Madagascar.

Mastigocera [Euchromia sect. Horamia] ædippus and *M. clavipes*, spp. nn., Boisd. Lép. Guat. p. 81, Guatemala, Mexico.

NYCTEOLIDÆ.

Halias prasinana. On a sound supposed to be produced by this insect, see T. H. Hedworth, Ent. v. pp. 116, 117.

Earias insulana, Boisd. Rogenhofer (Verh. z.-b. Wien, xx. pp. 869–874) describes the transformations of this species, and gives *siliquana*, H.-S., *frondosana*, Walk., and *gossypii*, ? Frauenfeld, as synonyms; *chlorion*, Ramb., and *fulvidana*, Wallengr., are varieties. The species occurs in Spain, Crete, Sicily (?), Syria, Egypt, Madagascar, Mauritius, Bourbon, South and East Africa, North and South India, Java, Fiji.

Earias pugeli, sp. n., Rogenhofer, Verh. z.-b. Wien, xx. p. 872 (? = *fabia*, Cram.; ? = *frondosana*, var. β , Walk.), India, New Holland.

LITHOSIIDÆ.

BOISDUVAL briefly characterizes his genus *Ochodes*. Pet. Nouv. no. 19.

Ctenucha venosa, Walk. Boisduval redescribes this species as new, Lép. Guat. p. 83.

Gnophæla (Dioptis) æquinotialis, Walk. Boisduval redescribes this species as new, *l. c.* p. 87.

Pericopsis perspicua, Walk., = *Pap. nasica*, Fabr.: Butler, Cat. Lep. Fabr. p. 291.

Epicopeia. On a Chinese species mimicking *Papilio menicius* see Proc. E. Soc. 1870, pp. 35, 36.

Heterusia remota, Walk. Holdsworth has published a description of the larva, Proc. E. Soc. 1870, p. 21.

Lithosia. Zeller remarks on several European species of this genus, S. E. Z. 1870, pp. 88, 89.

Setina. Speyer has published some very interesting remarks on this genus, with special reference to *S. aurita* and *ramosa*, which he considers to be almost, but not entirely, perfectly developed species. The three species which he considers the main stems of the genus are *irrorella* (with *freyeri* and *andereggii*), *roscida* (with *kuhlweini*, *alpestris*, *melanomos*, and *flavicans*), and *aurita* (with *ramosa*).

The following changes take place in *Setina ramosa* at a considerable altitude:—1, the size diminishes; 2, the covering of the body is rougher and more matted, from the hair becoming longer and thicker; 3, in proportion to the thickening of the covering of the body, the thickness of the scaling of the wings diminishes; 4, the colour is generally paler; 5, the black markings are usually more extended; 6, the shape of the wings is altered. Corresponding changes take place in the mountain-forms of various species, while other species are unaffected by the altitude. In conclusion, Speyer attempts to explain the object of these modifications in mountain-insects, S. E. Z. 1870, pp. 63–76.

Euchelia jacobæ. J. Greene has bred a specimen with only three wings. Ent. v. p. 98.

Euphanesa mendica, Walk., described and figured by Robinson, Ann. Lyc. N. York, ix. p. 152, pl. 1. f. 1.

KNAGGS suggests that the genus *Nola* should either precede or follow the *Lithosiidæ*: Cab. List Lep. pp. 3, 11.

Glaphyra atomosa, Brem., = *Nola centonalis*, Hübn.: Lederer, Ann. E. Belg. xiii. p. 31.

New species:—

Melandia [*Melanchroia*] *æquinotialis*, Boisd. Léop. Guat. p. 77, Guatemala, Honduras.

Epilais [*Dioplis*, sect. *Hyrmina*] *æquatorialis* (Feld. ined.), Honduras, Mexico, Guatemala; *E. zetila*, Guatemala; *E. melda*, Nicaragua, Quito: Boisd. l. c. p. 78.

Ditaxis [*Dioplis*] *sora*, Boisd. l. c. p. 79, Guatemala.

Charidea arrogans, Guatemala, Honduras; *C. hæmatodes*, *C. eximia*, Honduras, Mexico: Boisd. l. c. p. 82.

Ctenucha salatis, *C. pollinia*, Honduras, Guatemala; *C. opaca*, Honduras, Guatemala, Mexico: Boisd. l. c. pp. 83, 84.

Lycomorpha chlora, Venezuela; *L. chilensis*, Chili: Schauf. Nunq. Ot. pp. 11, 12.

Letocles [*Siosta*] *alcera*, Nicaragua, Amazon; *L. decia*, Guatemala: Boisd. l. c. p. 84.

Milodora agis, Boisd. l. c. p. 85, Nicaragua.

Thebrone [*Pericopsis*] *arema*, Nicaragua, Venezuela; *T. rubrimargo*, Honduras, Mexico: Boisd. l. c. pp. 85, 86.

Aphisson [*Pericopsis*] *salvatoris*, Boisd. l. c. p. 86, Honduras, Guatemala.

Evagra [*Diopthis*] *notochloris*, Honduras; *E. jalifa*, Honduras, Mexico; *E. affinis*, Honduras, Guayaquil: Boisd. l. c. pp. 87, 88.

Cocastrea gentilis, *C. melanchroia* (Feld. ined.), Guatemala, Boisd. l. c. p. 89.

Calepidos [*Esthema*] *celina*, Guatemala; *C. anacharsis*, Nicaragua: Boisd. l. c. p. 89.

Pericopsis ignita, Butler, Cat. Lep. Fabr. p. 291, Lepid. Exot. vi. p. 46, pl. 17. f. 3, Tapajos; *P. jansoni*, Butl. l. c. f. 4, 5, Chontales.

Chetone [*Pericopsis*] *loræ*, *C. phæba*, *C. aorsa*, Guatemala; *C. iscarotes*, Honduras, Guatemala; *C. felderi*, Nicaragua; *C. heliconides*, Guatemala: Boisd. l. c. pp. 90, 91.

Xanthyrus (*Chrysauge*) *pseudisis*, Nicaragua, Venezuela; *X. adunca*, Nicaragua, Bogotá; *X. basina*, Guatemala, Venezuela; *X. osera*, Honduras, Mexico: Boisd. l. c. p. 93.

Pyrалopsis divisa, Boisd. l. c. p. 94, Guatemala.

Retila (*Josia*) *pseudena*, *B. enoides*, Boisd. l. c. p. 94, Honduras, Mexico.

Lithosia cordula, Honduras, Mexico; *L. sanguineola*, Guatemala, Mexico: Boisd. l. c. p. 95.

Doracis coracina, Boisd. l. c. p. 96, Honduras, Mexico.

Euchelia jenna, Boisd. l. c., Guatemala, Mexico.

Euphanessa unicolor, Robinson, Ann. Lyc. N. York, ix. p. 153, pl. 1. f. 2, Texas.

Nola subchlamydula, Staudinger, Hor. Ent. Ross. vii. pp. 107, pl. 1. f. 6, 7, Attica, Castile (larva also noticed); *N. squalida*, Staud. B. E. Z. 1870, p. 102, Andalusia.

ARCTIIDÆ.

Ocnogyna loewii, Zell. Lederer figures a variety from Transcaucasia, Ann. E. Belg. xiii. p. 32, pl. 1. f. 8.

Arctia isabella, Hübn. Transformations figured, Amer. Ent. ii. p. 182.

Arctia celia, Saund. Saunders describes the larva, Canad. Ent. ii. p. 74.

Arctia pudica and *rivularis* belong to a separate genus, *Euprepia*, H.-S. Staudinger, Hor. Ent. Ross. vii. p. 111.

Chelonia caja. A variety described by G. T. Porritt, Ent. M. M. vii. p. 143.

Spilosoma virginica, F. Transformations figured and described, Amer. Ent. ii. pp. 272, 273.

Lophocampa maculata, larva, figured in Harris's 'Entom. Correspondence,' pl. 3. f. 9, = *L. tessellaris*, Sm., Abb.; and the larva described as that of *L. tessellaris* belongs to a new species. Amer. Ent. i. p. 204.

New species:—

Ocnogyna corsica, Ramb., var. *sardoa*, Staud. B. E. Z. 1870, p. 105, Sardinia.

Arctia fasciata, Esp., var. *esperii*, Staud. l. c. p. 103, Old Castile (larva also noticed).

Dorimena (*Daretis*) *magdala*, Boisd. Léop. Guat. p. 98, Guatemala.

Spilosoma dilecta, Boisd. l. c. p. 97, Honduras, Mexico.

Phæoptera alboguttata, Boisd. l. c. p. 99, Honduras.

Lophocampa harrisii (= *L. tessellaris*, p. Harr. nec Sm. et Abb.), Amer. Ent. i. p. 205, United States.

LIPARIDÆ.

Orgyia leucostigma. Larva figured, Amer. Ent. ii. p. 306.

Orgyia antiqua. Knaggs records an instance of males of this species being attracted by females of *O. gonostigma*, Ent. M. M. vii. p. 117.

Orgyia ericæ. On parthenogenesis in this species, see Maassen, S. E. Z. 1870, p. 62.

Dasychira rossii, Curt. Möschler describes this species in full, S. E. Z. 1870, p. 252.

Liparis salicis. J. Hellins (Ent. M. M. p. 264) publishes notes on this insect.

Euproctis ? *innotabilis*, sp. n., Walker, Ent. v. p. 124, Arabia.

PSYCHIDÆ.

R. MITTFORD publishes "Notes on Psychidæ," Ent. M. M. vi. p. 186.

SPEYER considers this family to be a connecting link between the *Tineina*, *Liparidæ*, and *Zygænidæ*. S. E. Z. 1870, p. 221.

Thyridopteryx ephemeræformis. Transformations figured and described Amer. Ent. ii. pp. 35-38. Rathvon publishes some very interesting observations on the habits, structure, &c. of this species, l. c. p. 81.

Fumea reticella, Newm. Knaggs records the discovery of the female of this species, Ent. Ann. 1871, p. 79.

Psyche febretria, Boyer, var. ? or sp. n.?, described by Staudinger, Hor. Ent. Ross. vii. p. 113.

Psyche crassicornis, sp. n., Staudinger, l. c. p. 114, pl. 1. f. 8, Greece ; *P.* (??) *luteipalpis*, sp. n., Walk. Ent. v. p. 125, Arabia ; *P.* (??) *nigrimanus*, sp. n., Walk. l. c., Red Sea ; *P. præcellens*, sp. n., Staud. B. E. Z. 1870, p. 106, Old Castile.

Fumea raiblensis, sp. n., Mann, Verh. z.-b. Wien, xviii. p. 40, Raibl in Upper Carinthia.

NOTODONTIDÆ.

Dicranura vinula, *Notodonta ziczac*, and *Pygæra bucephala*. Specimens bred with three wings, see Ent. v. pp. 114, 115, 147, 173.

Notodonta concinna. Transformations figured, Amer. Ent. ii. p. 27.

Bombyx (*Clostera*) *anastomosis* very destructive to poplars at Poitiers ; irregular in appearance. Ann. Soc. Ent. Fr. 1870, pp. 8, 9.

Clostera curtuloides, sp. n., Ersch. Cat. Lep. Ross. p. 65, Irkutsk.

Rilia (?) *lignifica*, sp. n., Walker, Ent. v. p. 125, Red Sea.

LIMACODIDÆ.

TROUVELET remarks on some points of analogy between *Limacodes* and the *Hymenoptera*. P. Bost. Soc. xii. pp. 92, 93.

Limacodes pithecium, Sm., Abb., and *Eupretia stimulea*, Clem. Larvæ figured in Amer. Ent. ii. pp. 25, 59, 340.

DREPANULIDÆ.

Edapteryx bilineata, Pack., = *Platypteryx lacertinaria*, Linn. : Möschler, S. E. Z. 1870, p. 252, note.

Platypteryx lacertinaria. Tengström describes var. *dimidiata* from Lapland, Fauna et Flora Fenn. Förh. x. p. 302, note.

SATURNIIDÆ.

Attacus cynthia. This species, introduced into Australia some years ago, has now become a perfect pest. Wallace, Ent. Ann. 1871, p. 106.

Attacus ethra, Walk. (= *A. lebeau*, Guér.). A. Ernst describes the transformations of this common Venezuelan species, which he thinks may prove useful as a silk-producer. Zool. Gart. 1870, pp. 63-65.

Platysamia cecropia, L. On rearing, Landois, Verh. Ver. Rheinl. 1869, pp. 84, 85; eggs described, Sprague, Amer. Ent. ii. pp. 82, 83; transformations and parasites figured and described, Amer. Ent. ii. pp. 97-102; on the fluid emitted by the insect on emerging from the pupa, Chapman, Ent. M. M. vii. pp. 81, 82.

Attacus [*Telea*] *polyphemus* figured and described in Amer. Ent. i. pp. 121, 122.

Antheræa yama-mai. W. V. Andrews (Amer. Ent. ii. pp. 39-42) has published some experiments with this species. He finds that eggs placed in an ice-house are liable to lose their vitality, and thinks that they require to be exposed when near hatching, not to direct sunshine, but to a good degree of heat.

Antheræa yama-mai. A. G. More publishes details of some unsuccessful attempts to rear this species in Ireland: J. R. Dubl. Soc. v. pp. 486-489. Guérin-Ménéville remarks that similar means are used to rear it in Japan to those employed in Europe: Ann. Soc. Ent. Fr. Séances, 1870, pp. 11, 12.

Antheræa perni. A. Wallace makes some observations on the habits of this species, and records his having obtained hybrid eggs between *A. perni*, ♂, and *A. yamamai*, ♀. The larva and cocoon most resembled those of the former species; the imago had not yet appeared. Proc. E. Soc. 1870, pp. 11, 12.

On *Antheræa perni* near Shanghai, see Proc. E. Soc. 1870, pp. 21, 36; on rearing this species in England, see G. Gascoyne, Ent. v. p. 28.

Saturnia carpini. On assembling in this species see T. W. Wonfor, Ent. v. pp. 144-146.

Attacus [*Saturnia*] *pyri*. A sterile dwarf female noticed by Girard, Ann. Soc. Ent. Fr. Séances, 1870, pp. 58, 59.

Ceratocampa regalis figured and described in all its stages, Amer. Ent. i. pp. 230, 231, front.

Saturnia dura, sp. n., Kefenstein, Entom. Notiz. p. 15, f. 6, Madagascar.

Brahmæa swanzii, sp. n., Butler, Proc. E. Soc. 1870, p. 41, Fantee, W. Africa.

BOMBYCIDÆ.

On the larva of a *Bombyx*, which lives under stones in brooks in Guiana, see Bar and Oberthur, Ann. Soc. Ent. Fr. Séances, 1870, p. 8.

Phalena castrensis, Smith & Abb., = *Bombyx frutetorum*, Boisd., = *decepiens*, Walk.; and *Phal. ilicifolia*, Sm. & Abb., = *Bomb. carpiniifolia*, Boisd., = *occidentalis* [*occidentis*], Walk.: Maassen, Nouv. Ent. no. 20.

E. HOLDSWORTH repeats his former statement that he has bred *Æona punctata*, *Lasiocampa remota*, and *Lebeda hebes* from the same larvæ. Proc. E. Soc. 1870, pp. 20, 21. [Comp. Zool. Rec. vi. p. 393.]

Bombyx rubi. On the habits of the larva see Ent. v. pp. 59, 78.

Bombyx franconica, Borkh. Staudinger defines var. *alpina*: Hor. Ent. Ross. vii. pp. 116, 117.

Eriogaster lanestris. M. A. J. Pitman states that he observed the wings of a newly emerged specimen of *E. lanestris*, which was knocked from its perch while they were still limp, shrink again to their former size on emerging from the pupa-case. Ent. v. p. 58.

Chsiocampa sylvatica, Harr. Transformations described, larva and imago figured, and remedies discussed in Amer. Ent. ii. pp. 261-266.

Chsiocampa americana, Harr. Larva figured, Amer. Ent. i. p. 208; transformations described and figured by W. Le Baron, l. c. ii. pp. 143-146.

Chsiocampa americana and *Hyphantria textor* are remarked on in Amer. Ent. ii. p. 39.

Two larvæ are described as belonging to *Dryocampa pellucida* in Harris's Ent. Correspondence: the first is probably that of *C. rubicunda*; the second = *D. bicolor* ? in Proc. Ent. Soc. Phil. iii. pp. 425, 426, and may or may not be the true *D. pellucida*. Amer. Ent. i. p. 205.

Dryocampa rubicunda, Fab. Larva described by Saunders, Canad. Ent. ii. p. 75.

Bombyx mori and Sericulture.

GUÉRIN-MÉNEVILLE publishes (R. Z. 1870, pp. 45-48, 72-80, 214-224) his usual series of reports on Sericulture. He records the continued success of Baron de Bretton, Madame Baumann, and M. Chazy in rearing *Antheræa yama-mai*; publishes a report from the French minister in Japan relative to the habits of the insect in that country, and the means adopted to rear it. (Of the eggs sent to France by this gentleman only 20 per cent. were fertile; and most of these hatched before the oaks were in leaf.) Guérin-Ménéville also records a hermaphrodite specimen of *Bombyx mylitta*, bred by M. Henzi, and thinks that the epidemic among *B. mori* is gradually decreasing. M. Renard has sent eggs of a very strong Chinese race to France; the silkworms were reared by different experimenters with varying success. Guérin-Ménéville attributes the epidemic to unwholesome food; and, while not placing much confidence in M. Pasteur's views, recommends that the matter should be further investigated.

DELANDEE (R. Z. 1870, pp. 121-128) reviews the various publications on Sericulture which have recently appeared in England, Holland, Austria, Prussia and Sweden. He publishes a letter from O. Zik, giving details of recent experiments in Austro-Hungary (pp. 153-158), and publishes (pp. 189-192) an account of the progress of Sericulture in Cochin China and Cambodia.

A. WALLACE has published (Ent. Ann. 1871, pp. 101-107) some notes on Sericulture, chiefly with reference to the feasibility of rearing *Bombyx mori* in England and the British colonies. For further remarks see Proc. E. Soc. 1870, pp. 10, 11.

A. B. FARN has published an abstract, with useful additional notes, of a valuable official Report (No. 1) by Mr. Adams, secretary to H.M. Legation in China, on the "Central Silk Districts of Japan." Ent. v. pp. 87-91.

On the Japanese silk-trade, see Proc. E. Soc. 1870, pp. 21, 22.

PASTEUR has published a valuable work on the diseases of silkworms (*vide*

suprà, p. 369). On rearing silkworms by his method, see C. R. vol. lxxi. pp. 182-185, 293-298, Atti Soc. Ital. xiii. pp. 24, 25, 745-751, 755-772.

GIRARD remarks on various parasites on silkworms. Ann. Soc. Ent. Fr. Séances, 1870, pp. 53, 54, 61-63.

On monads &c. existing in the intestines of unhealthy silkworms, see Bordone and Dumas, C. R. vol. lxx. pp. 1160-1162.

A memoir by Tigri attributing pebrine to a species of *Bacterium* is mentioned in C. R. vol. lxx. p. 122.

Bombyx mori will eat Osage orange in America. Amer. Ent. ii. pp. 293, 373.

Further information on silkworms may be found in almost every periodical which has the slightest connexion either with natural history or animal products.

ZEUZERIDÆ.

Cossus ligniperda. T. A. Chapman suggests that the fluid discharged from the mouth of the larva of the species is of an oily character. Ent. M. M. vii. pp. 18, 19.

Xyleutes robinix, Peck. Transformations described and figured, Amer. Ent. ii. pp. 127, 128.

Eudagria psychidion (sp. n., = *uhula*, var. ?), Staudinger, Hor. Ent. Ross. vii. p. 112.

HEPIALIDÆ.

Hepialus velleda. Transformations described by W. Buckler, Ent. M. M. vii. pp. 84, 85.

MÖSCHLER remarks on his *Epialus hyperboreus* and on *E. labradoriensis*, Packard. He considers that *Hepialus pulcher*, Grote, is identical with the former species. S. E. Z. 1870, pp. 251, 252.

NOCTUIDÆ.

BERCE has published "Faune Entomologique Française, Lépidoptères," 3^{me} vol. Hétérocères, 1^{re} partie, containing descriptions of the French Noctuidæ as far as the genus *Mesogona*. A few pages of general remarks on the family are prefixed to the book.

A long article on the "Cotton Army-worm," *Noctua (Anomis) xyliana*, Say, is published in Amer. Ent. i. pp. 207-209; see also p. 342. In the same paper the "Boll-worm" (*Heliothis armigera*) and the "true Army-worm" (*Leucania unipunctata*, Haw.) are noticed. The three species are described and figured in all their stages, and full details are given as to their habits and the means employed to destroy them.

F. BUCHANAN WHITE records *Leucania littoralis* and *Heliothis marginata* as new to Scotland. Ent. M. M. vi. p. 190.

MAASSEN (S. E. Z. 1870, pp. 329-333) publishes full directions for collecting at sugar, and adds a list of nearly 60 species of *Noctuæ* collected by him from August 20th to the middle of October, in the neighbourhood of Elberfeld. The species are nearly all British [cf. Weymer, *ibid.* p. 398].

G. NORMAN has noticed *Noctua baja* and *Leucania pallens* in cop. at sugar. Ent. M. M. vii. p. 88.

KNAGGS suggests that the genus *Aventia* should follow *Toxocampa*. Cab. List Lep. p. 7.

Diphthera deridens, Guén. Larva described by Saunders, Canad. Ent. ii. pp. 145, 146.

Acronycta oblinata, Guén. Figured with cocoon and larva, Amer. Ent. ii. p. 341.

Acronycta myricæ. Larva described by W. Buckler, Ent. M. M. vii. p. 83; *Acronycta leporina* and *A. alni*. For notes on the larvæ see Ent. v. pp. 170, 171; Ent. M. M. vi. p. 189.

Leucania unipuncta, Haw. A paper on this species, said to be identical with *L. extranea*, Guén., and with the "Army-worm" of the United States, is reprinted in Ent. v. pp. 91-95, from the Amer. State Ent.

Nonagria brevilinea, Fenn. Knaggs remarks on the distinctness and variability of this species, Ent. Ann. 1871, pp. 73, 74.

Tapinostola bondii, Doubl. [Knaggs]. Staudinger records it from Greece, Hor. Ent. Ross. vii. pp. 126, 127.

Eudryas grata, F., and *E. unio*, Hübn. Remarkd on in Amer. Ent. ii. pp. 152, 153; the imago of the first, and the supposed larva of the second are figured.

Xylophasia zollikoferi, Preyer. On the occurrence of this species in England, see Doubleday, Ent. v. pp. 29, 30.

Mamestra prædita, Hübn. Lederer figures a doubtful specimen from Transcaucasia, Ann. E. Belg. xiii. p. 33, pl. 1. f. 11.

Mamestra arctica, Encyc. Larva described by Saunders, Canad. Ent. ii. p. 75.

Mamestra dysodea. Staudinger notices and figures var. *innocens* from Attica, l. c. p. 123, pl. 1. f. 10.

Miana arcuosa. J. Batty remarks on the larva, Ent. M. M. vii. p. 88.

Caradrina cubicularis. Tengström describes var. (or sp. n. ?) *cinerascens* from Finland. Fauna et Flora Fenn. För. xi. p. 309, note.

Agrotis. Möschler (S. E. Z. 1870, pp. 254, 265-269) enumerates the species of this genus which occur in Labrador: *A. littoralis*, Pack., probably = *Pachnobia carnea*, Thunb.; *A. okakensis*, Pack., = *A. wockei*, Möschl.; *A. dissona*, Möschl., is distinct from *A. rava*, H.-S., to which Packard refers it; *A. septentrionalis*, Möschl., = *A. fusca*, Boisd., ♂

Agrotis fimbriola, Esp. ? or n. sp. ? is noticed by Lederer from Astrabad. Hor. Ent. Ross. viii. p. 15.

Agrotis segetum destructive to tobacco in the department of the Dordogne. Lucas, Ann. Soc. Ent. Fr. Séances, x. pp. lxvii, lxviii.

Noctua dahlia. Larva described by W. Buckler. Ent. M. M. vi. pp. 261, 262.

Pachnobia carnea. *Agrotis littoralis*, Pack., and *Episema gothica*, Christoph., are synonyms of this species according to Möschler. S. E. Z. 1870, pp. 265, 266, 271.

Tæniocampa leucographa. Larva described by Newman, Ent. v. pp. 141, 142.

Xanthia cerago and *silago*. Larvæ compared by W. Buckler, Ent. M. M. vi. pp. 262-264.

Cirrhædia xerampelina. C. S. Gregson publishes some remarks on this insect, Ent. M. M. vi. p. 265. See also J. Hellins (*op. cit.* pp. 284, 285). On its eggs and young larvæ, see B. Hartley, Ent. v. pp. 18, 19.

Dianthæcia barrettii. Knaggs remarks on some varieties of *D. conspersa* 1870. [VOL. VII.] 2 E

somewhat resembling this species, and thinks that *D. barrettii* will eventually be placed in a genus by itself. Ent. Ann. 1871, pp. 77, 78; see also Ent. v. pp. 30, 31, 57, 77, 81, 97.

Dianthæcia irregularis. Larva described by G. T. Porritt, Ent. v. pp. 177, 178.

Polia nigrocincta. Notes on life-history, published by E. Newman, Ent. v. pp. 192-194.

Epunda lutulenta. Larva described by W. Buckler, Ent. M. M. vi. pp. 235, 236.

Xylina semibrunnea. Larva described by Newman and G. T. Porritt, Ent. v. pp. 161, 162, 216, 217.

Cucullia. Speyer compares the European *C. lucifuga*, W. V., with *C. intermedia*, sp. n., from North America: S. E. Z. 1870, pp. 400-406.

Cucullia verbasci. J. Jenner Weir states that according to his experience the larvæ of this species are never eaten by birds, even when they are attracted to the plants on which the larvæ are feeding. The imago, however, is greedily devoured. Tr. E. Soc. 1870, pp. 337, 338. Newman describes the larva, Ent. pp. 194-196.

Chariclea victorina, Sodoffsky. Lederer notices the larva, Ann. E. Belg. xiii. p. 35.

Heliothes armigera. A second article on this species and on others injurious to corn, with figures of the transformations of the former, is published in Amer. Ent. ii. pp. 42-44.

Anarta. Möschler (S. E. Z. 1870, pp. 364-366) states that *A. melanopa*, Thunb., = *A. melanopa*, *vidua* (Hüb.), and *nigrolunata* of Packard; and describes *A. zetterstedtii*, Staud. *A. bicycla*, Pack., = *A. melaleuca*, Thunb.: Möschl. l. c. p. 272.

Anarta acadiensis. Bethune has reprinted his description of this species, Canad. Ent. ii. pp. 64, 65.

Heliodes theophila, Staud. Staudinger remarks on and figures this species, Hor. Ent. Ross. vii. p. 131, pl. 2. f. 1.

Hydrelia unca. Larva described by Hellins, Ent. M. M. vi. pp. 232, 233.

Thalpochares hansa, Herr.-Schäff. Lederer notices the larva, Ann. E. Belg. xiii. p. 35.

Megalodes eximia, Freyer. Lederer notices the larva and corrects his former account of it, l. c. p. 36.

Plusia acuta, Walk. (= *P. verticillata*, Guén. var.). The capture of a specimen of this African species in England is recorded. Ent. M. M. vii. p. 138; Ent. Ann. 1871, pp. 79, 80.

Gonoptera libatrix. R. C. R. Jordan publishes a note on the larva, Ent. M. M. vii. p. 117.

Amphipyra tragopogonis. Larva described by Bethune, Canad. Ent. ii. pp. 73, 74.

Amphipyra effusa, Boisd. Staudinger describes and figures var. *sciaphila* from Parnassus: Hor. Ent. Ross. vii. p. 129, pl. 1. f. 12.

Catocala fraxini. Knaggs has observed that this species is provided with large fans on its fore legs, like some *Pyrales* and *Geometridæ*. Ent. Ann. 1871, p. 75.

Ophiusa bistriaris, Hüb. Larva described by Saunders, Canad. Ent. ii. p. 130.

Litoprosopus, g. n., Grote, Tr. Am. Ent. Soc. ii. p. 308. Allied to *Dyops*: third joint of labial palpi smoothly and closely scaled, elongate and sub-spatulate. Type *Noctua hatney*, Poey.

New species :—

Bryophila petricolor, Lederer, Ann. E. Belg. xiii. p. 46, pl. 1. f. 9.

Laphygma retrahens, Walk. Ent. v. p. 126, Mount Sinai.

Prodenia autumnalis, Riley (*P. daggyi*, Riley, MS. olim.), Amer. Ent. ii. pp. 328, 329, 363–365. Transformations described and figs. of larvæ and imagines. Missouri.

Heliophobus fallax, Staud. B. E. Z. 1870, p. 116, Sarepta; larva also noticed.

Cerigo amathusia, Ramb. Ann. Soc. Ent. Fr. Séances, 1870, pp. 30, 68, Perpignan.

Luperina coluteæ, Bienert, Lep. Ergebn. p. 35, Persia.

Manestra mixtura, *M. immiscens*, Walk. l. c. pp. 126, 127, both from Arabia; *M. rogenhoferi*, Möschl. S. E. Z. 1870, p. 266, Southern Labrador; *M. (?) siccanorum* (Christoph, in litt.), Staud. B. E. Z. 1870. p. 114, Sarepta.

Celena intractata, *C. (?) plagifera*, Walk. l. c. p. 127, Red Sea.

Mythimna impar, Staud. B. E. Z. 1870, p. 117, Sarepta.

Caradrina vicina, Staud. (*staudingeri*, Christoph MS.), l. c. p. 118, Sarepta.

Caradrina petræa, Tengstr. Fauna et Flora Fenn. Förh. x. p. 356, Karelia.

Agrotis culminicola, Switzerland; *A. arenicola*, Corsica; *A. christophi*, ab. ingens, *A. basigramma*, *A. deserta*, Sarepta; *A. rogneda* (v. Nordm. i. l.), Crimea: Staud. l. c. pp. 107–113. *A. millieri* (Staud. i. l.), Berce (= *A. cos*, var. ?), Faune Fr. Léop. iii. p. 139, Ardèche. *A. interneza*, Red Sea; *A. inobtrusa*, *A. (?) mollis*, Mount Sinai; *A. (??) marginata*, Arabia: Walk. l. c. pp. 128, 129. *A. ledereri*, Ersch. Cat. Lep. Ross. p. 67, Irkutsk; *A. multifida*, Lederer, Ann. E. Belg. xiii. p. 46, pl. 1. f. 10, Transcaucasia; *A. stabulorum*, Bienert, Lep. Ergeb. p. 34, Persia; *A. capnistis*, Led. Hor. Ent. Ross. viii. p. 14, pl. 2. f. 1, Astrabad; *A. cycladum* (= *cis*, var. ?), Staud. Hor. Ent. Ross. vii. p. 121, pl. 1. f. 9, Naxos.

Triphæna sarmata, Ramb. Ann. Soc. Ent. Fr. 1870, p. xxx, hab. — ?

Cerastis rubigo (= *C. vaccinii*, var. D, Guén.), Ramb. l. c. 1870, p. 30, hab. — ?

Polia pygmæa, Staud. Hor. Ent. Ross. vii. p. 124, note, pl. 1. f. 11, Smyrna.

Valeria ? spilogramma, Ramb. l. c. p. xxxi, Central Russia.

Lithocampa millierei, Staud. B. E. Z. 1870, pp. 119, 330, Catalonia (larva also noticed).

Xylina (?) infusa, Walk. Ent. v. p. 129, Red Sea.

Cucullia intermedia, Speyer, S. E. Z. 1870, p. 400, New York.

Cleophana yvanii, Dup., var. *diffuens*, Staud. l. c. p. 121, Andalusia. (Larva figured by Rambur, Cat. Lep. Andal. t. 14. f. 4, as that of *C. yvanii*.)

Cleophana opposita, Lederer, Ann. E. Belg. xiii. p. 47, pl. 1. f. 12, Transcaucasia.

Euphasia (?) compta, Walk. l. c. p. 130, Mount Sinai.

Acontia partita and *A. (?) inexacta*, Walk, l. c., Red Sea.

Erastria penultima, Ersch. Cat. Lep. Ross. p. 68, Balagansk, in prov. Irkutsk.

Thalpochara keyserlingi, Bienert, Lep. Ergebn. p. 36, Persia; *T. compuncta*, Led. Hor. Ent. Ross. viii. p. 15, Astrabad; *T. conicephala*, Spain, Macedonia, Persia; *T. baueri*, Andalusia?, Staud. l. c. p. 122.

Prothymia conicephala, Staud. l. c. p. 121, Led. Hor. Ent. Ross. viii. p. 16, pl. 2. f. 3, Malaga, Salonica, Astrabad.

Spintherops hirsuta, Staud. l. c. p. 123, Valais.

Cycligramma importuna, Kefenstein, Entom. Notiz. p. 15, f. 7; *C. intellecta*, Kef. l. c. p. 16, f. 8; both from Madagascar.

Penicillaria petrificata, Walk. l. c. p. 131, Red Sea.

Briarda (?) *subapicalis*, Walk. l. c., Arabia.

Grammodes (?) *latifera*, Walk. l. c. p. 132, Mount Sinai.

GEOMETRIDÆ.

GREGSON has published notes on the variability of many species of British *Geometridæ* in his collection. Ent. v. pp. 70-76.

Ellopie (*Abraxas*) *ribearia*, Fitch. Transformations figured and described in Amer. Ent. ii. pp. 13, 14.

Pericallia syringaria. G. Elisha publishes some notes on the larva, Ent. v. p. 170.

Selenia illustraria. On an abnormal second brood see J. Greene, Ent. M. M. vi. pp. 190, 217.

Ennomos tiliaria. Larva described by Newman, Entom. v. p. 196.

Eugonia quercinaria, Hufn. Zeller maintains that this species = *quercinaria*, Herr.-Schäff, and not *angularia*, as thought by Werneburg. Tijdschr. Ent. ii. 5. p. 237, note.

Nyssa hispidaria. Larva described by G. T. Porritt, Ent. v. p. 141.

Synopsis sociaria, Hübn. On the variability of this species and its larva see Staudinger, Hor. Ent. Ross. vii. pp. 162, 163.

Aplodes rubivora, Riley. Figured with larva, and described in Amer. Ent. ii. pp. 203-205.

Acidalia. Möschler (S. E. Z. 1870, pp. 366-368) refers *O. okakaria*, Pack., to *A. frigidaria*, Möschl., and *Aspilates spuriaria*, Christoph., to *Acid. sentinaria*, Hübn.

Acidalia perochraria, F. v. R. This species, formerly confounded with *A. ochrata*, W. V., has occurred in England. Ent. M. M. vii. p. 138; Ent. Ann. pp. 81, 82. Appended is a translation of Fischer's remarks (l. c. pp. 82-87).

A. strigaria, Hübn. This species, new to Britain, is described and figured by Knaggs, Ent. Ann. 1871, pp. 88, 89, f. 1.

Acidalia rusticata, W. V. On the variability of the occurrence of spurs in this species see Staudinger, Hor. Ent. Ross. vii. pp. 146, 147. Newman describes the larva, Ent. v. pp. 176, 177.

Acidalia reversata, Tr. P. Staudinger remarks on and figures this species, Hor. Ent. Ross. vii. pp. 145, 146, pl. 2. f. 2.

Acidalia turbidaria, H.-S. Staudinger describes and figures var. *turbulentaria* from Attica, l. c. p. 151, pl. 2. f. 3.

Acidalia contiguaria, Hb. Larva described by Fuchs, JB. Ver. Nass. 1867 1868 (xxi., xxii.), pp. 261-263.

Cabera pusaria. A variety described by J. P. Barrett, Ent. v. p. 215.

Ematurga atomaria. Staudinger notices a variety, *orientaria*, l. c. p. 166.

Sterrho anthophilaria, Hübn., var. *rosearia*, Tr., is fully described by Staudinger, l. c. p. 168.

Lythria purpuraria. Larva described by Newman, Ent. v. pp. 175, 176. An aberration of this species, or a new species between *L. purpuraria* and *L. sanguinaria* is recorded by Erschoff from Omsk. Bull. Mosc. 1870, i. p. 219.

Ortholitha vicinaria, Dup., figured by Lederer, Ann. E. Belg. xiii. p. 49, pl. 2. f. 2.

Pellonia sicanaria, Zell. On the structure of the spurs in this species see Staudinger, l. c. pp. 156, 157.

Emmelesia unifasciata. Life-history described by J. Hellins, Ent. M. M. vi. pp. 186-188.

Eupithecia. Dietze describes the larvæ of *E. irriguata*, Hübn. (S. E. Z. 1870, pp. 336, 337; transl. Ent. M. M. vii. pp. 14, 15), and of *E. fraxinata*, Crewe, which latter species occurs at Frankfort, Mayence, and in the Odenwald. He states that *E. fraxinata* is, like *innotata*, probably double-brooded; on which the editor remarks that *innotata* is certainly single-brooded in Eastern Germany, at least in the Oder district, and that Knoch only observed one brood at Brunswick.

Eupithecia consignata. Larva described by Newman, Ent. v. pp. 160, 161.

Eupithecia rectangulata, L. Tengström describes var. *colligata* from Karelia: Fauna et Flora Fenn. Förh. x. p. 358.

Hypsipetes impluvata. Larva described by Buckler, Ent. M. M. vii. pp. 42, 43.

Coremia labradorensis, Pack., probably = *Cidaria munitata*, Hübn., according to Möschler, S. E. Z. 1870, p. 371.

Phibalapteryx lapidata. Taken in Ireland by S. R. Fetherstonhaugh, Ent. v. pp. 215, 216.

Cidaria tristata. Von Nolcken has investigated the synonymy of this and two allied species, which he gives as follows:—1. *tristata*, Linn., Cl., Lang, Müll., Fuessl., De Vill., Borkh., Tr., = *tristata*, p., W. V., Goeze, Brahm, Dup., Guén., = *tristata*, ♀, Zett., Heinem., Snellen, = *funeraria*, De la Harpe, = *limbosignata*, Nolck. 2. *hastulata*, Hübn., Beitr. (nec Geom. f. 356), = *luctuata*, Hübn., Lang (nec W. V.), = *tristata*, Hübn., Ill., Schr., De la Harpe, Nolck., = *tristata*, p., W. V., Dup., Guén., Snellen, = *tristata*, ♂, Zett., Heinem. 3. *funerata*, Hübn., H.-S., Guén. Remarks on the synonymy follow: *alchemillata*, W. V., is not *tristata*, L.; *pupillata*, Thunb., is unrecognizable. Verh. z.-b. Wien, xx. pp. 59-68.

Cidaria tristata, L., and *limbosignata*, Nolck. Grentzenberg points out the differences between these varieties: Schr. Ges. Königs. x. p. 117.

Cidaria nubilata, Pack., = *Lygris lugubrata*, Möschl., according to Möschler, S. E. Z. 1870, p. 368.

Cidaria unicata, Guén. Staudinger figures this species, Hor. Ent. Ross. vii. pl. ii. f. 5.

Cidaria diversilineata destructive to the grape. Transformations described by Saunders, Canad. Ent. ii. pp. 128, 129.

Cidaria salicata, Hübn. Staudinger gives *ruficinctaria*, Gu., *probaria*,

H.-S., *ablutaria*, H.-S., *poderinaria*, H.-S., *olivaria*, Dup., and *probaria*, Mann, as varieties of this species. Hor. Ent. Ross. vii. pp. 172, 173.

Malacodea, g. n., Tengstr. Fauna et Flora Fenn. Förh. x. p. 357. Allied to *Cheimatobia*; all the wings with median cell large, extending far beyond the middle of wings; fore wings with the additional cell of nervure 11 long, divided in the middle; hind wings with one dorsal nervure, and the space between nervures 3 and 4 twice as large as between 4 and 5. Antennæ filiform, finely fasciculate-fimbriolate; palpi very short; tongue very small, naked, and weak. Type *M. regelaria*, sp. n., l. c., Lapland.

Thysanodes, g. n., Ramb. Ann. Soc. Ent. Fr. Séances, 1870, p. 31. Allied to *Cheimatobia*; hind wings narrower. Type *T. phryganea*, sp. n., l. c., Touraine.

New species :—

Cherodes exiliata, Herr.-Schäff. CB. Ver. Regensb. 1870, p. 185, Cuba.

Drepanodes griseocostaria, Cuba, Herr.-Schäff. l. c. p. 186; *D. sesquilinea*, Grote, Canad. Ent. ii. pp. 114, 115, 121-123, 142-151, United States.

Apicia rectisignaria and *A. heterochloriaria*, Cuba, Herr.-Schäff. l. c. pp. 186, 187.

Caberodes marginaria, Minot, P. Bost. Soc. xiii. p. 169, Massachusetts.

Pero curvistrigaria, Cuba, Herr.-Schäff. l. c. p. 184.

Azelina decisaria, Cuba, Herr.-Schäff. l. c. p. 185.

Biston græcarius, Staudinger, Hor. Ent. Ross. vii. p. 159, Greece; *B. incisarius*, Lederer, Ann. E. Belg. xiii. p. 48, pl. 1. f. 14, Transcaucasia.

Cleora pulchraria, Minot, l. c. p. 170, Boston.

Boarmia abjectaria, *B. quadricostaria*, Cuba, Herr.-Schäff. l. c. p. 188.

Tephrosia fumataria, Massachusetts, Minot, l. c. p. 84.

Gnophos colchidaria, Lederer, Ann. E. Belg. xiii. p. 48, pl. 2. f. 1, Transcaucasia.

Geometra croceofimbriata, *G. desolataria*, *G. centrifugaria*, *G. protractaria*, Herr.-Schäff. l. c. p. 182, Cuba.

Eucrostis albicostaria, *E. niveociliaria*, Herr.-Schäff. l. c. pp. 181, 182, Cuba.

Phorodesma fulminaria, Led. Hor. Ent. Ross. viii. p. 17, pl. 2. f. 4, Astrabad.

Zonosoma (= *Ephyra*, Dup., = *Anisodes*, Guén.) *nanularia*, *Z. occipitaria*, Cuba; *Z. cæcaria*, Venezuela; *Z. extranearia*, Cuba: Herr.-Schäff. l. c. pp. 180, 181.

Asellodes nigrofasciaria, Herr.-Schäff. l. c. p. 183, Cuba.

Acidalia ossiculata, Led. Hor. Ent. Ross. viii. p. 18, pl. 2. f. 5, Astrabad, Taurus; *A. ansulata*, Led. l. c. p. 19, pl. 2. f. 6, Astrabad; *A. disjunctaria*, Staud. B. E. Z. 1870, p. 124, Catalonia.

Acidalia chionæata, *A. canularia*, *A. subroseata*, *A. floccularia*, Herr.-Schäff. l. c. p. 181, Cuba.

Timandra putzilo, Ersch. Cat. Lep. Ross. p. 69, prov. Irkutsk.

Neclusia fimbriata, Herr.-Schäff. l. c. p. 182, Cuba.

Terpnomicta subpusaria, Herr.-Schäff. l. c. p. 187, Cuba.

Macaria centrosignata, *M. cellulata*, *M. trientata*, Herr.-Schäff. l. c. p. 184, Cuba.

Tephрина destituta, Walk. Ent. v. p. 153, Cairo.

Fidonia bicoloraria, Minot, Massachusetts; *F. faxonii*, New England Minot, l. c. p. 83.

Sterrhia marginata, Walk. l. c. p. 153, Red Sea.

Aspilates curvifera, Walk. l. c. p. 154, Cairo.

Anisopteryx ? *strigataria*, Boston; *A. strigularia*, Mount Washington. Minot, l. c. pp. 84, 170.

Larentia subcertaria, *L. decertaria*, *L. subgaleata*, *L. anguinata*, *L. aristata*, *L. artificata*, *L. balata*, *L. balteolata*, Herr.-Schäff. l. c. pp. 189, 190, Cuba.

Eupithecia heydenaria, Staud. B. E. Z. 1870, p. 128, Switzerland; *E. alliaria*, Staud. l. c. p. 129, Ofen (larva described (p. 130) by Rogenhofer); *E. peyerimhoffata*, Millière, Pet. Nouv. no. 22, Spain.

Eupithecia offirmata, Speyer, in Grentzenberg, Schr. Ges. Königsb. x. p. 120, Prussia.

Coremia oppressa, Walk. Ent. v. p. 154, Red Sea.

Triphosa taochata, Lederer, Ann. E. Belg. xiii. p. 50, pl. 2. f. 5, Transcaucasia.

Lygris roessleraria, Staud. l. c. p. 329, Asia Minor.

Cidaria quadripunctata, Bionert, Lep. Ergebn. p. 39, Persia; *C. obvallata*, Led. Hor. Ent. Ross. viii. p. 20, pl. 2. f. 7, *C. chionata*, Led. l. c. p. 20, pl. 2. f. 8, both from Astrabad; *C. modestaria*, Ersch. Cat. Lep. Ross. p. 70, Irkutsk; *C. depeculata*, Lederer, Ann. E. Belg. xiii. p. 50, pl. 2. f. 6, Transcaucasia; *C. subhastata*, v. Nolck. Verh. z.-b. Wien, xx. p. 68 (= *hastulata*, Hüb. Eur. Schmett. Geom. t. 69. f. 356, nec Hüb. Beitr.), North Europe; *C. ludificata*, Staudinger, Hor. Ent. Ross. vii. p. 174, pl. 2. f. 4; *C. kalischata*, Staud. B. E. Z. 1870, p. 127, Malaga, Oran.

Eubolia jugicola, Staud. B. E. Z. 1870, p. 125, Spain, Pyrenees.

Anaitis opificata, *A. perpetuata*, Led. l. c. pp. 49, 50, pl. 2. f. 3, 4, Transcaucasia.

PYRALIDÆ.

KNAGGS suggests that the *Pterophoridae* should follow the *Botyde*: Cab. List Lep. p. 11.

Hypena benignalis, Walk., = *H. baltimoralis*, Walk.: Robinson, Ann. Lyc. N. York, ix. p. 310.

Desmia maculalis, Westw. Transformations figured and described, Amer. Ent. ii. pp. 208, 209.

Hypenodes costæstrigalis. Larva described by J. Hellins, Ent. M. M. vi. pp. 216, 217.

Cledeobia græcalis, Dup., = *moldavica*, Esp.: Staudinger, Hor. Ent. Ross. vii. p. 284.

Asopia costalis. Transformations figured, Amer. Ent. i. p. 226.

Stenia hymenalis, Guén., = *S. supbandalis*, Hüb.: Staud. Hor. Ent. Ross. vii. p. 184.

Stenia carnealis, Tr. Staudinger (l. c. p. 185, pl. 2. f. 8) figures and describes var. *gigantalis*, from Parnassus, and states that *carnealis*, H.-S., = *corsicalis*, Dup., and *carnealis*, Zell., perhaps also belongs to this species: *carnealis*, Dup., is not that of Tr., but resembles *diffusalis*, Guén.

Mecyna polygonalis, Hüb. This species is figured in Newman's Insect-hunter's Year-Book, 1870 (?) as *Scopula fulvatis*. Cf. Doubleday, Ent. v. pp. 76, 77.

Botys sanguinalis, L. Staudinger refers to this species, as varieties, *hæmatalis*, Hübn., *auroralis*, Zell., and *virginalis*, Dup. Hor. Ent. Ross. vii. pp. 186-188.

Botys aurata, Scop. Tengström describes ab. ? *aquilationis*, from Karelia: Fauna et Flora Fenn. Förh. x. p. 358. He also (*l. c.*) describes *B. manualis*, Hübn., var. ? *septentrionalis*, Karelia.

Botys pulveralis, Hübn. Staudinger describes and figures var. *grisealis*, *l. c.* p. 193, pl. 2. f. 10, from Greece.

Botys institalis, Hübn. Staudinger describes and figures var. *græcalis*, *l. c.* p. 199, pl. 2. f. 15.

Botys fimbrialis, Dup. Staudinger describes and figures an aberration (?) or sp. n. (?), from Naxos, under the name of *veneralis*: *l. c.* p. 198, pl. 2. f. 14.

Botys argillacealis, Zell., = *B. nemausalis*, Dup. Staudinger suspects their identity, *l. c.* p. 189.

Botys glacialis, Pack., is probably identical with *B. inquinatalis*, Zell., according to Möschler, Stett. Ent. Zeit. 1870, p. 371.

Botys frumentalis, L., var. *australis*, described by Bienert, Lep. Ergebn. p. 40, from Persia.

Eudorea frigidella, Pack., = *E. centuriella*, W. V., according to Möschler, S. E. Z. 1870, p. 371.

Eudorea ambigualis, Tr. V. Nolcken classifies the varieties of this species, Lep. Fauna Esthland & c. Microlep. i. p. 325.

Eudorea staudingeralis, Mab., = *E. incertalis*, Dup.: Bellier de la Chavignerie, Ann. Soc. Ent. Fr., Séances, 1870, p. 7.

Scoparia muralis. Larva described by W. Buckler, Ent. M. M. vii. p. 13.

Galleria cereana. Transformations figured, Amer. Ent. i. p. 246.

Melissoblastes anellus. Staudinger describes ab. ? *unicolor* (or sp. n. ?) from Greece. Hor. Ent. Ross. vii. p. 212.

Homocosoma nebulella, W. V. Larva described by V. Nolcken, Lep. Fauna Esth. & c. Micr. i. p. 336.

Myelois rhodochrella, H.-S. Staudinger figures and describes var. ? *hellenica* from Attica, *l. c.* p. 209, pl. 2. f. 18.

Nephopterix angustella. W. Machin describes the habits of this species in its various stages. Ent. v. pp. 77, 78.

Pempelia obductella, F. v. R., has occurred in England. Ent. M. M. vii. p. 85; Ent. Ann. 1871, pp. 89, 90.

Pempelia formosa. Larva described by W. Buckler, Ent. M. M. vii. p. 14.

Phycita nebulo, Walsh, is destructive to apple-trees. Saunders, Canad. Ent. ii. pp. 126-128.

Crambus fusciniellus (*pedriolellus*). Larva and habits described by Buckler, Ent. M. M. vii. p. 160, 161.

Chilo phragmitellus. Larva described by Buckler, *l. c.* vi. pp. 188, 189.

Schenobius sordidellus, Zinck., and *S. longirostellus*, Zell. Zeller's description of the former translated, and the latter described by Robinson, Ann. Lyc. N. York, ix. p. 312.

Leucanimorpha, g. n., Walker (*Herminide*), Ent. v. p. 133. Body slender; proboscis long, slender; palpi erect, stout, rising much higher than the head,

2nd joint with a thick conical tuft, 3rd linear, truncated at tip, about half the length of 2nd. Antennæ long, smooth, slender. Abdomen nearly flat, extending a little beyond the hind wings. Legs smooth, slender, rather long; tibiæ and tarsi spinulose, hind tibiæ with 4 long slender spines. Wings broad; fore wings rounded at tips; exterior border slightly rounded and oblique. Type *L. disjuncta*, sp. n., Walker, *l. c.*, Red Sea.

New species :—

Madopa platizona, Lederer, Ann. E. Belg. xiii. p. 47, pl. 1. f. 13, Transcaucasia.

Hypena internalis and *H. evanidalis*, Rob. Ann. Lyc. N. York, ix. p. 311, both from Pennsylvania.

Herminia (PP) *tenebrifera*, Walk. Ent. v. p. 133, Red Sea.

Pyralis wernburgalis, Keferstein, Entom. Notiz. p. 16, f. 9, Madagascar.

Aglossa signicostalis, Staudinger, Hor. Ent. Ross. vii. p. 180, pl. 2. f. 6, Parnassus.

Anthophiloides baphialis (Led. ?), Staudinger, *l. c.* p. 183, pl. 2. f. 7, Egypt, Russia, Greece, Palestine.

Cledeobia armenialis, Lederer, Ann. E. Belg., xiii. p. 51, pl. 2. f. 7, 8, Transcaucasia.

Herbula determinata, Walk. Ent. v. p. 134, Red Sea.

Erychnia ledereri, Staud. B. E. Z. 1870, p. 193, Hungary.

Hercyna multiguttalis (= *pollinalis* ab. ?), Staud. *l. c.* p. 200, pl. 2. f. 16, Greece.

Oligostigma albalis, Robinson, Ann. Lyc. N. York, ix. p. 153, pl. 1. f. 3, New York, Pennsylvania.

Cataclysta bifascialis, Rob. *l. c.* p. 154, pl. 1. f. 4, Texas.

Botys pollicalis (= *virginalis*, H.-S. nec Dup., = *sanguinalis*, L. var. ?), *B. (Orobena ?) infirmalis*, *B. subfuscalis*, *B. serratalis*, *B. helenalis*, Staud. *l. c.* pp. 189–195, pl. 2. f. 9–13.

Botys labutonalis, Led. Hor. Ent. Ross. viii. p. 22, pl. 2. f. 9, Astrabad.

Orobena nomadalis, Led. *l. c.* p. 22, pl. 2. f. 10, Astrabad.

Scopula. Walker (Ent. v. pp. 151–153) describes *S. variabilis*, *S. flexifera*, *S. serpentina*, *S. effrenata*, *S. includens*, *S. inscita*, *S. submarginalis*, Red Sea, African coast.

Trachonitis (?) *pryerella*, H. Vaughan, Ent. M. M. vii. p. 130 (cf. Ent. Ann. 1871, p. 90, f. 3), England.

Homœosoma senecionis, Vaughan, *l. c.* p. 131 (larva described by Buckley *l. c.*), Knaggs, Ent. Ann. 1871, p. 91, f. 2, Essex. *H. sazicola*, Vaugh. *l. c.* pp. 132, 160.

Ancylois (?) *maculifera*, Staud. B. E. Z. 1870, p. 193, Sarepta.

Epischmia ? *asteris*, Staud. *l. c.* p. 199, Vendée.

Hypochalcia ghilianii, Staud. *l. c.* p. 200, Piedmont.

Myelois deserticola, *M. pallida*, *M. albicosta*, *M. xylinella*, Sarepta; *M. angusta*, Catalonia; *M. ochracea*, *M. xanthogramma*, *M. (Acrobasis) chicanensis*, Andalusia; *M. (P) kalischiiella*, Granada; *M. ? (Acrobasis) lozogramma*, Andalusia: Staud. *l. c.* pp. 201–206. *M. cognata*, Vienna, Sardinia; *M. xanthocephala*, Sarepta: Staud. *l. c.* pp. 273, 274. *M. crepusculella*, *M. tephriella*, Lederer, Ann. E. Belg. xiii. p. 53, pl. 2. f. 11, 12, Transcaucasia.

Nymphopteryx (♀) *spurcata*, Red Sea; *N.* (♀) *priscella*, Cairo: Walk. *l. c.* p. 155. *N. macra*, Sarepta; *N. diaphana*, Malaga: Staud. *l. c.* p. 197.

Pempelia gallicola, Ardèche (larva also); *P. malacella*, Malaga; *Etiella* (*Pemp.*) *zinckenella*, Tr. P., ab. *decipiens*, Granada: Staud. *l. c.* pp. 131, 195, 196.

Ancylolomia inornata, Staud. *l. c.* p. 194, Sicily.

Eromene lata, Staud. Hor. Ent. Ross. vii. p. 204, pl. 2. f. 17, Greece; *E. texana*, Robinson, Ann. Lyc. N. York, ix. p. 155, Texas.

Crambus colchicellus, *C. levigatellus*, Lederer, Ann. E. Belg. xiii. p. 52, pl. 2. f. 9, 10, Transcaucasia; *C. perspicuus*, Walk. Ent. v. p. 155, Egypt, Arabia; *C. pulcherrimus*, Staud. B. E. Z. 1870, p. 192, Sarepta.

TORTRICIDÆ.

Tortrix, *Teras*, and *Conchylis*. The N.-American species of these genera are described and figured by Robinson, Tr. Am. Ent. Soc. ii. pp. 261-288, pls. 1, 4-8. He is convinced that the arrangement of the Tortrices greatly requires revision. He notices the following known species, besides many new ones:—*Tortrix rosaceana*, Walk.; *T. purpurana*, Clm.; *T. fractivittana*, Clm.; *T. fuscolineana*, Clm.; *T. vesperana*, *T. breviornatana*, Clm.; *T. furcatana*, Walk.; *T. rileyana*, Gr.; *T. melaleucana*, Walk. (= *semifusca*, Clm.); *T. algidana*, Möschl. (= *gelidana*, M.); *T. reticulatana*, Cl. (= *subauratana*, Walk.); *T. sulphureana*, Clm. (= *fulvroseana*, *virginiana*, and *gallivorana*, Cl., = *gratana*, Walk.); *T. albicomana*, Cl.; *T. humerosana*, Cl.; *T. cerasivorana*, Fitch; *T. discopunctana*, Clm.; *T. peritana*, Clm.; *T. sentana*, Clm.; *T. flavedana*, Clm.; *T. incertana*, Clm.; *T. lutosana*, Clm.; *Teras flavivittana*, Clm.; *T. hastiana*, Linn., var. *divisana*, Hübn.; *T. maculidorsana*, Clm. (= *hastiana*, var. P.); *T. viburnana*, Clm.; *T. gallicolana*, Clm.; *Conchylis lepidana*, Clm.

Penthina picana, *capreana*, *betuletana*, and *prælongana*. V. Nolcken endeavours to unravel the synonymy of these species. Lep. Fauna Esthl. Micr. i. pp. 395-397.

Penthina metallicana, Hübn. Tengström describes var. *ferruginea* from Lapland. Fauna et Flora Fenn. Förh. x. p. 361.

Penthina fullerea, Riley. Transformations figured and described. Amer. Ent. ii. pp. 204, 205. (Cf. M. E. Murtfeldt, *l. c.* p. 371.)

Penthina vitivorana, Pack., is figured and its habits described in Amer. Ent. i. pp. 177-179. Stated to = *Lobesia botrana*, *l. c.* p. 273.

Tortrix inopiana, Haw., and *T. viburnana*, W. V. V. Nolcken describes the forms of these species. Lep. Fauna Esthl. Micr. i. pp. 359-363, 367, 368.

Tortrix rigana, Std. Larva described by v. Nolcken, Lep. Fauna Esthl. Micr. i. pp. 370-372.

Tortrix gelidana and *T. algidana*, Möschl., = *T. möschleriana*, Wocke Möschler, S. E. Z. 1870, p. 363.

Peronea. Knaggs brackets together *potentillana*, Cooke, *proteana*, H.-S., and *comariana*, Zell., on Staudinger's authority: Cab. List Lep. p. 13. He remarks on *P. proteana* and its allies: Ent. Ann. 1871, pp. 92, 93. Cf. Cooke, Ent. M. M. vii. pp. 41, 42.

Teras fimbriana and *T. ferrugana*. Tengström describes several varieties of these two species. Fauna et Flora Fenn. Förh. x. p. 359.

Teras fimbriana, Thunb. V. Nolcken describes this species and its varieties at great length. Lep. Fauna Esthl. Micr. i. pp. 345-350.

Teras comariana, Zell., and *T. proteana*, H.-S. Von Nolcken has bred these forms from the same larvæ. He quotes *comparana*, Zell., as another synonym, and thinks that *potentillana* (with which, however, he is unacquainted) = *comariana*. Lep. Fauna Esthl. Micr. i. pp. 350, 351. Cf. also Zeller, Tijds. Ent. ii. 5, pp. 253-258.

Semasia obscurana, Steph. Editors of Ent. M. M. (vi. pp. 185, 186) remark on this species, which was bred from oak-galls, and suggest that *Grapholitha gallicolana*, v. Heyd., may be a var. of it, as its habits are the same.

Stigmonota weirana. C. Healy describes the habits of this insect in its various stages. Ent. v. pp. 79, 80.

Retinia pinivorana, Z. Tengström describes var. ? *sciurana*, from East Bothnia. Fauna et Flora Fenn. Förh. x. p. 380.

Carpocapsa pomonella. Figured in all its stages, and habits fully described, in Amer. Ent. i. pp. 112-114. Staudinger describes var. *putaminana*, Hor. Ent. Ross. vii. p. 226.

Anchylopera fragariæ, Walsh and Riley, is described and figured, Amer. Ent. i. p. 89.

Grapholitha duplicana, Zett. Staudinger describes var. *græca*: Hor. Ent. Ross. vii. p. 225.

Sciaphila wahlbomiana, L. Staudinger notices the varieties of this species, and describes var. ? *cupressivorana* from Greece, l. c. p. 215. Von Nolcken refers to this species *allicolana*, *virgaureana*, *minorana*, *communana*, *incertana*, H.-S. He also describes the larvæ. Lep. Fauna Esthl. Micr. i. pp. 373-376.

Sciaphila sinuana, Wilk. Tengström describes a species from Karelia which he considers identical with this. Fauna et Flora Fenn. Förh. x. p. 360.

Sciaphila niveosana, Pack., = *S. osseana*, Scop.: Möschler, S. E. Z. 1870, p. 373.

Eupæcilia degreyana. C. G. Barrett publishes notes on the habits and food-plant of this species, Ent. M. M. vii. pp. 158, 159.

Conchylis ciliella, Hübner. Larva described by V. Nolcken, Lep. Fauna Esthl. Micr. i. pp. 382-384. V. Nolcken also (l. c. pp. 387-389) points out the differences between *C. pallidana* and *C. dubitana*.

Cochylis urozana, Neum. Wulfschlegel (Ber. St. Gall. Ges. 1868-1869, pp. 179-185) describes the habits and transformations of this species, which is very destructive to the vine, and details the various methods which have been adopted to check its ravages.

Conchylis chalcana, Pack., = *C. deutschiana*, Zett., according to Möschler, S. E. Z. 1870, p. 373.

Oxypteron, g. n., Staudinger, B. E. Z. 1870, p. 276. Allied to *Cheimatophila*. Type *O. impar*, sp. n., l. c., Sarepta.

New species:—

Penthina sieversiana, v. Nolck. Lep. Fauna Esthl. Micr. i. 407, Ilpen, Pichtendahl; *P. phlomidana*, Staud. Hor. Ent. Ross. vii. p. 220, pl. 3. f. 1, Greece.

Tortrix. Robinson (Tr. Am. Ent. Soc. ii. pp. 263-278, pls. 1-6) describes and figures the following new species from the United States:—*T. gurgitana*, *T. lamprosana*, *T. limitata*, *T. zapulata*, *T. sambornana*, *T. furvana*, *T. pal-lorana*, *T. lata*, *T. alisellana*, *T. parallela*, *T. grisea*, *T. fumosa*, *T. nigridia*, *T. pettitana*, *T. caryæ*, *T. puritana* (= *unifasciana*, Clem.), *T. violaceana*, *T. confusana*, *T. irrorea*, *T. paludana*, *T. minuta*, *T. cana*, *T. flacciduna*, *T. laterana*.

Tortrix lapponana, Tengstr. Fauna et Flora Fenn. Förh. x. p. 310, Lapland.

Dichrorampha harpeana, Staud. B. E. Z. 1870, p. 283, Upper Engadine;
D. plusiana, Staud. l. c. p. 284, Engadine.

Teras. Robinson (l. c. pp. 280-283, pl. 7) figures from the United States:—*T. perspicuana*, *T. inana* (= *hastiana*, var. ?), *T. nigrolinea*, *T. placidana*, *T. trisignana*, *T. semiannula*, *T. deflectana*, *T. brewsteriana*, *T. celiana*.

Retinia tessulatana, Malaga; *R. miniatana*, Lyon: Staud. l. c. pp. 280, 281.

Phthoroblastis? *aurantiaca*, Staud. l. c. p. 286, Hungary.

Grapholitha candidulana, v. Nolck. Lep. Fauna Esthl. Micr. i. p. 413, Pichtendahl; *G. trisignana*, v. Nolck. l. c. p. 427, Rotsikull; *G. Güntheri*, Tengstr. Fauna et Flora Fenn. Förh. x. p. 361; *G. clanculana*, *G. cornu-copiae*, Tengstr. l. c. p. 362, Karelia; *G. plumbiferana*, *G. confinitana*, Greece, Staud. Hor. Ent. Ross. vii. pp. 224-226, pl. 3. f. 2; *G. placidana*, *G. astragalana*, Sarepta, Staud. B. E. Z. 1870, pp. 281, 282.

Sciaphila lætana, Staudinger, l. c. p. 275, Old Castile.

Olindia pedemontana, Staudinger (= *albulana*, var. ?), l. c. p. 275, Macu-gnaga.

Conchylis. Robinson (l. c. pp. 284-288, pl. 8) figures from the United States:—*C. agassizi*, *C. quinquemaculana*, *C. ridingsana*, *C. bimaculana*, *C. dorsimaculana* (= *angustana*, Clem.), *C. promptana*, *C. angulatana*, *C. argenti-limitana*, *C. labeculana*, *C. interruptofasciata*, *C. bunteana*.

Conchylis argentiomixtana, Sarepta; *C. clathrana*, Sarepta; *C. santolinana*, Old Castile; *C. pyramidana* (Zell. MS.), Sarepta: Staud. l. c. pp. 277-280. *C. defectana*, Lederer, Ann. E. Belg. xiii. p. 54, pl. 2. p. 13, Transcaucasia.

Argyrolepis luridana, Gregson, Ent. v. p. 80, copied Ent. Ann. 1871, p. 93, Westmoreland.

TINEIDÆ.

VON HEINEMANN has published another volume of his work on the *Lepidoptera* of Germany and Switzerland, containing the *Choreutina*, *Atychina*, and the first part of the *Tineina*. He remarks (p. 15) that *Exapate gelatella* belongs to the *Tortricina*. His arrangement is nearly similar to that proposed by Herrich-Schäffer in CB. Ver. Regensb. vol. viii. Von Heinemann treats of the following 12 families in the present volume:—*Talæporidæ*, *Lypusidæ*, *Tineidæ*, *Adelidæ*, *Ochsenheimeridæ*, *Teichobidæ*, *Acrolepidæ*, *Hyponomeutidæ*, *Plutellidæ*, *Orthoteliidæ*, *Chimabac-chidæ*, and *Gelechidæ*. Two-thirds of the volume are devoted to the *Gelechidæ*; and the great genus *Gelechia* is entirely broken up. The family *Teichobidæ* appears to be new: characters those of the genus *Teichobia*.

STANTON'S "Second Visit to the Engadine" chiefly consists of notes on the *Tineina* observed: Ent. Ann. 1871, pp. 1-14.

Stainton's 'Tineina of Southern Europe' is reviewed at length, Bull. Ent. Ital. 1870, pp. 91-93.

Solenobia cembrella, L. Tengström remarks on specimens from Lapland and Finland supposed to belong to this species. Fauna et Flora Fenn. Förh. x. p. 363.

Tinea cubiculella, Staud. Staudinger notices and figures this species, Hor. Ent. Ross. vii. p. 230, pl. 3. f. 3.

Swammerdamia. Stainton (Nat. Hist. Tineina, xi. pp. 40-87, pl. 2. f. 1-3) figures and describes *S. griseocapitella*, Staint., *S. cæsiella*, Hübn., *S. pyrella*, Vill., in all their stages.

Prays. Stainton (l. c. pp. 2-39, pl. 1. f. 1, 2) figures and describes *P. curtiellus*, Don, and *P. oleellus*, Fabr., in all their stages.

Plutella cruciferarum, *P. limbipennella*, Clem., and *Cerostoma brassicella*, Fitch, are synonymous with this species, which is destructive to cabbages and gillyflowers in America. Amer. Ent. i. p. 199.

Cerostoma radiatella, Don. Tengström describes var. *sulphurea* from Alandia: Fauna et Flora Fenn. Förh. x. p. 341, note.

Depressaria. Stainton (l. c. pp. 134-219, pls. 5-8) reviews the history of the genus from 1861. He also describes and figures in all their stages *D. carduella*, Hübn.; *D. subpropinquella*, Staint.; *D. culcitella*, Herr.-Schäff.; *D. artemisiae*, Nick.; *D. absinthiella*, Herr.-Schäff.; *D. putridella*, Hübn.; *D. rutana*, Fabr.; *D. nodiflorella*, Mill.; *D. atomella*, Hübn.; *D. uhulana*, Rössl.; *D. silella*, Staint.; *D. dictamnella*, Tr.

D. atomella. Stainton (l. c. p. 218) mentions the possibility of there being two species confounded under this name.

Depressaria. Robinson (Ann. Lyc. N. York, ix. pp. 155-157, pl. 1) describes and figures *L. cinereocostella*, *D. atrodorsella*, *D. lecontella*, and *D. pulvipennella*, Clemens.

Depressaria. Staudinger (Hor. Ent. Ross. vii. pp. 241-255) describes several known Eastern species at considerable length.

Depressaria cnicella. Economy described by H. Moncreaff, Ent. v. pp. 200, 201.

Depressaria granulosa. Barrett has observed the larva of this species. Ent. M. M. vii. pp. 159, 160.

Depressaria ramosella, Staint., is figured by Lederer, Ann. E. Belg. xiii. pl. 2. f. 14.

Depressaria subhella, Staud. Staudinger describes this species in full, and suggests that it may be a variety of *D. subpropinquella*, Staint. Hor. Ent. Ross. vii. p. 243.

Depressaria albipunctella, Hübn. Staudinger describes and figures var. ? or n. sp. ? *albiocellata*, from Acarnania, l. c. p. 246, pl. 3. f. 8.

Gelechia cerealella, Oliv. This or some undetermined species of *Tineida* has recently proved very destructive to barley near Norwich. C. G. Barrett, Tr. Norw. Soc. 1869, 1870, pp. 27-29.

Gelechia trimaculella, Pack., = *G. continuella*, Zell., according to Möschler, S. E. Z. 1870, p. 375.

Cleodora striatella, S. V., and *C. tanacetella*, Schr. Rössler describes the differences between these two forms, and comes to the conclusion that they are distinct species, S. E. Z. 1870, pp. 258-261.

Bupalis punctivittella, Costa. Staudinger figures and describes var. *confluens* from Greece, l. c. p. 276, pl. 3. f. 14.

Glyphipteryx. Stainton (Nat. Hist. Tineina, xi. pp. 228-277, pl. 7) figures and describes in all their stages *G. haworthana*, Steph., *G. equitella*, Scop., and *G. fischeriella*, Zell.

Antispila. Stainton (l. c. pp. 298-325, pl. 8. f. 2, 3) figures and describes *A. pfeifferella*, Hübn., and *A. treitschkiella*, F. v. R.

Heliozela. Stainton (l. c. pp. 278-297, pl. 8. f. 1) figures and describes *H. resplendella*, Staint.

Zelleria. Stainton (l. c. pp. 88-125, pl. 3) figures and describes *Z. phillyrella*, Mill., *Z. oleastrella*, Mill., and *Z. saxifragæ*, Staint.

Coleophora leucapennella, Hübn. Gärtner describes the transformations of this species, of which *C. albifascella*, Zell., is the ♀. He remarks that Stainton has put each into the section to which the other structurally belongs. Gärtner has also bred *C. nutantella*. Verh. Ver. Brünn. vii. pp. 174-180.

Coleophora caucasica, Staint., is figured by Lederer, Ann. E. Belg. pl. 2. f. 15.

Stathmopoda. Stainton (Nat. Hist. Tineina, xii. pp. 40-67, pl. 2) figures and describes *S. pedella*, Linn., and *S. guerini*, Staint.

Cosmopteryx. Stainton (l. c. pp. 2-39, pl. 1) figures and describes *C. lieni-giella*, Zell., *C. orichalcea*, Staint., and *C. schmidiella*, Frey.

Oinophila v-flava. On this species as injurious to wine-corks, see Ent. v. p. 44.

Chauliodes. Stainton (l. c. xii. pp. 68-105, pl. 3. f. 1-3) figures and describes *C. staintonellus*, Mill., and *C. illigerellus*.

Laverna. Stainton (l. c. xi. pp. 126-227, pls. 4-6) figures and describes *L. phragmitella*, Staint.; *L. propinquella*, Staint.; *L. fulvescens*, Haw.; *L. epilobiella*, Röm.; *L. decorella*, Steph.; *L. subbistrigella*, Haw.; *L. rharniella*, Zell.

Asychna. Stainton (l. c. xii. pp. 106-125, pl. 4. f. 1, 2) figures and describes *A. terminella*, Westw., and *A. ceratella*, Zell.

Ochromolepis. Stainton (l. c. pp. 126-133, pl. 4. f. 3) figures and describes *O. icetella*, Hübn.

Phylloporia, g. n., v. Heinem. Schmett. Deutschl. u. d. Schweiz, ii. 2. p. 57. Fore wings broader and shorter than in *Tinea*, with only 10 nervures. Larva differing in habit. Type *Tinea bistrigella*, Haw.

Wockia, g. n., v. Heinem. l. c. p. 102. Allied to *Calantica*; fore wings longer, with the seventh nervure differently placed; hind wings with a more obtuse hinder angle to the middle cell. Type *W. funebrella*, sp. n., l. c. p. 103, Oberrnigk.

Herrichia, g. n., Staud. B. E. Z. 1870, p. 292. Allied to *Hyponomeuta*. Type *excelsella*, sp. n., l. c., Lahr.

VON HEINEMANN (Schmett. Deutschl. u. d. Schweiz, ii. 2) separates the genus *Gelechia* as originally employed by Zeller into the 28 following genera, of which all except those marked with an asterisk are new:—**Psoricoptera*, **Gelechia*, *Pecilia*, *Bryotropha*, *Silotroga*, *Argyritis*, **Lita*, *Brachmia*, *Teleia*, **Recurvaria*, *Tuchyptilia*, *Brachycrossata*, *Ceratophora*, *Rhinosia*, *Acanthophila*, **Anacamptis*, *Ergatis*, *Doryphora*†, *Monochroa*, *Lamprotes*, *Nannodia*, *Chelaria*, *Ptochemusa*, **Parasia*, *Apodia*, *Cladodes*, *Gonia*, and *Euteles*. A comparative table of these genera is given (l. c. pp. 188-191); and their characters are also given in full by Stainton (Ent. M. M. vii. pp. 165-168), so that it is unnecessary to repeat them here.

† Preoccupied in *Coleoptera*.

Metanarsia, g. n., Staud. B. E. Z. 1870, p. 315. Allied to *Anarsia*. Type *M. modesta*, sp. n., l. c., Sarepta.

Holcophora, g. n., Staudinger, l. c. p. 313. Allied to *Ypsolophus*. Type *H. statice*, sp. n., l. c., Sarepta.

Ecocetis (g. n.) *guyonella*. Allied to *Palpula*. A new genus and species of gall-feeder from Algeria described at great length, and figured in all its stages, by Guénée, Ann. Soc. Ent. Fr. (4) vol. x. pp. 5-16, pl. 1. f. 1-11; cf. Girard, l. c. vol. ix. pp. 476-478.

Atremaea, g. n., Staud. B. E. Z. 1870, p. 317. Allied to *Pterolonche*. Type *A. lonchoptera*, sp. n., p. 318, Vendée.

Cacochroa, g. n., v. Heinem. Schmett. Deutschl. u. d. Schweiz, ii. 2. p. 367. Allied to *Anchinia*; palpi differently formed; wings narrow and pointed; fringes much longer. Type *Tinea permixtella*, Herr.-Schäff.

Amphisbatis, g. n., Zell. S. E. Z. 1870, p. 304, note. Allied to *Butalis*; antennæ denticulate (pubescent-ciliate in ♂); second joint of palpi hairy beneath; tongue very short; venation of wings different; larva case-bearing, slender, and extremely lively. Type *Butalis incongruella*, Staint. (Translated by Stainton, Ent. M. M. vii. pp. 15, 16.)

New species :—

Taleporia alpestrella, v. Heinem. l. c. p. 20, Upper Engadine.

Solenobia mannii, l. c., Vienna; *S. fumosella*, Hanover; *S. wockii*, Breslau; v. Heinem. l. c. pp. 22-24.

Diplodoma adpersella, v. Heinem. l. c. p. 34, "Kaiseralp."

Euplocamus bienerti, Staud. B. E. Z. 1870, p. 207; Led. Hor. Ent. Ross. viii. p. 24, pl. 2. f. 11, 12, Persia.

Morphaga unicolor, Staud. l. c. p. 287, Sardinia.

Tinea atrifasciella, Ardèche, *T. angustipennis*, Munich, Staud. l. c. p. 288; *T. hyalinella*, Staud. Hor. Ent. Ross. vii. p. 229, Greece, Malaga; *T. atratella*, Staud. l. c. p. 231, pl. 3. f. 4, Attica; *T. curtella*, Tengstr. Fauna et Flora Fenn. Förh. x. p. 363, Karelia.

Lampronia triangulifera, Tengstr. l. c. p. 339, note.

Incurvaria splendidella, Styria; *I. ceneella*, Austria; *I. intermediella*, Ratibon: v. Heinem. l. c. pp. 61, 62.

Nemeophora reaumurella, Peyerimhoff, Pet. Nouv. no. 17, Hyères.

Adela orientella, Staud. Hor. Ent. Ross. vii. p. 233, pl. 3. f. 6, Greece; *A.*

fiorella, Staud. B. E. Z. 1870, p. 290, Sarepta.

Acrolepia tauricella, Staud. l. c. p. 319, Crimea.

Hyponomeuta diffuellus (Wocke, MS.), v. Heinem. l. c. p. 111, hab. — ?

Anesychia cirrhocnemis, Led. Hor. Ent. Ross. viii. p. 25, Astrabad.

Swammerdamia alternana, Staud. B. E. Z. 1870, p. 291, Upper Engadine; *S. nebulosella*, Stainton (= *nubeculella*, Mann in litt.; ? *compunctella*, H.-S.), Nat. Hist. Tineina, xi. p. 42, Zurich, Croatia; *S. nanivora*, Staint. Ent. Ann. 1871, p. 96, Scotland.

Zelleria plumbeella, Staud. B. E. Z. 1870, p. 320, Malaga.

Argyresthia arariella, Staint. Ent. Ann. 1871, p. 100, England.

Cerostoma satellitella, Sarepta; *C. nebulella*, Sarepta: Staud. l. c. pp. 293, 294.

Depressaria senecionis, Old Castile; *D. bupleurella*, Palatinate; *D. subpallorella* (? *pallorella*, Herr.-Schäff. f. 448; var. *c* (et *b*), Zell.), Montpellier: Staud. l. c. pp. 296-298.

Depressaria scopariella (= *atomella*, Zell., p., = *pulverella*, F. R.), Germany; *D. variabilis*, Germany; *D. rubescens*, Ratisbon; *D. amanthicella*, Bavarian Alps; *D. selini* (= *parilella*, var. c, Zell.), Brunswick, Jena; *D. bupleurella* (Staud. MS.), Rhenish Bavaria, Halberstadt; *D. reichlini*, Munich; *D. beckmanni*, Gastein; *D. silesiaca*, mountains of Silesia: v. Heinem. l. c. pp. 149–184. *D. sileris*, Pfaffenzeller, S. E. Z. 1870, p. 320, Engadine; *D. grotella*, Robinson, Ann. Lyc. N. York, ix. p. 157, pl. 1. f. 10, New York, Pennsylvania; *D. musculina*, Greece, *D. scabra*, Acarnania, *D. irrorata*, Greece, Staud. Hor. Ent. Ross. vii. pp. 241–251, pl. 3. f. 7–9.

Gelechia. Von Heinemann (l. c. pp. 199–218) describes:—*G. basiguttella*, Breslau, Carlowitz; *G. albicans*, Vienna; *G. suspectella*, Kronfortschen; *G. striolattella*, Brunswick; *G. nigricans*, Brunswick; *G. confusella*, Brunswick; *G. fuscantella*, *G. simplicella*, hab. —?; *G. angustella*, Brunswick; *G. cognatella*, Upper Engadine; *G. nebulosella*, Istria.

Gelechia. Staudinger (B. E. Z. 1870, pp. 299–312) describes:—*G. libidinosa*, Alps of Piedmont; *G. hungariae*, Hungary; *G. pascuicola*, Old Castile; *G. spiraeae*, Sarepta; *G. rhombelliformis*, Sarepta; *G. syrticola*, Baden; *G. insularis*, Rhine; *G. deserticolella*, Sarepta; *G. culminicolella*, Switzerland; *G. ustulatella*, *G. orthogonella*, *G. furfurella*, *G. nieversi*, Sarepta; *G. magnetella*, Magnesia; *G. semicostella*, *G. robustella*, *G. pancaliella*, Sarepta.

Gelechia gracilella, England, *G. confinis*, Scotland, Staint. Ent. Ann. 1871, pp. 97, 98; *G. samadensis*, Pfaffenzeller, S. E. Z. 1870, p. 321, Samaden; *G. epomidella*, Tengstr. Fauna et Flora Fenn. Förh. x. p. 365, Karelia.

Brachmia petiginella, v. Heinem. Schmett. Deutschl. u. d. Schweiz. ii. 2, p. 232, Botzen.

Bryotropha alpicolella, Austrian Alps; *B. obscurella*, hab. —?; *B. glabrella*, Brunswick; *B. minorella*, Mödling: v. Heinemann, l. c. pp. 235–240.

Lita. Von Heinemann (l. c. pp. 247–267) describes:—*L. diffuella*, Switzerland; *L. tussilaginelletta*, Munich, Lausitz; *L. insulella*, islands of the Rhine; *L. pallidella*, Stettin; *L. porcella*, Ratisbon; *L. trochilella*, Brunswick; *L. pauperella*, Ratisbon; *L. melanella* and *L. nigripalpella*, Ratisbon; *L. pygmaella*, Upper Engadine; *L. albifrontella*, Vienna; *L. tristella*, Upper Engadine.

* *Teleia myricariella*, Von Heinem. l. c. p. 278, Baden.

Doryphora luteella (= *decolorella*, H.-S. nec Zell.), Vienna; *D. griseella*, Mombach; *D. acutangulella*, South Germany; *D. elongella*, Brunswick: v. Heinem. l. c. pp. 300–307.

Lamprotes plumbella, v. Heinem. l. c. p. 310, Wiesbaden.

Anacamptis ignobilicella, South Germany; *A. sarrothramnella*, Berlin, Stettin; *A. albifrontella*, Baden in Switzerland: v. Heinem. l. c. pp. 313–319.

Lecithocera orsoviella, v. Heinem. l. c. p. 361, Orsova.

Megacrasedus attritellus, *M. argyroneurellus*, Staud. B. E. Z. 1870, p. 316, both from Sarepta.

Pleurota vittalba, Parnassus; *P. nitens*, Attica; *P. nitens*, ab. *aurata*; *P. krueperella*: Staud. Hor. Ent. Ross. vii. pp. 258–263, pl. 3. f. 11–13.

Protasis pleurotella, Staud. B. E. Z. 1870, p. 317, Andalusia.

Ecophora luteella, Semmering; *Æ. pulverosella*, Kalditsch: v. Heinem. l. c. pp. 376, 377; *Æ. laserpitiella*, Pfaffenzeller, S. E. Z. 1870, p. 322, Samaden; *Æ. nolkeni*, Bienert, Lep. Ergebn. p. 42, Persia; *Æ. manni*, Led. Hor. Ent. Ross. viii. p. 25, pl. 2. f. 14, Astrabad.

- Blastobasis anthophaga*, Staud. B. E. Z. 1870, p. 319, Corsica.
Gracillaria braccatella, Staud. Hor. Ent. Ross. vii. p. 274, note, Smyrna; *G. Java*, Staud. B. E. Z. 1870, p. 321, Sarepta.
Coleophora cistorum, Peyerimhoff, Pet. Nouv. no. 15 bis, Hyères, Cannes.
Chaukodus daucelus, Peyerimhoff, l. c. no. 15 bis, Staint. Nat. Hist. Tineina, xii. pp. 82–84, pl. 3. f. 1, Hyères.
Stigmatophora tririvella, Staud. B. E. Z. 1870, p. 322, Sarepta.
Butakis ochrolitella, Staud. Hor. Ent. Ross. vii. p. 266, note, Smyrna; *B. apicistrigella*, Staud. l. c. p. 268, pl. 3. f. 15, Parnassus.
Butakis emichi, Anker, S. E. Z. 1870, p. 143, Hungary; *B. schleichiella*, Zeller, l. c. p. 305, Styria; *B. setiella*, Zell. l. c. p. 309, Sarepta.
Elachista freyi, Staud. B. E. Z. 1870, p. 322, Piedmont.
Lithocolletis millierella, Staud. B. E. Z. 1870, p. 323, Lyon, South Tyrol; *L. platani*, Staud. Hor. Ent. Ross. vii. p. 277, pl. 3. f. 18, Attica, Lombardy.
Lithocolletis unifasciella, Tengstr. Fauna et Flora Fenn. Förh. x. p. 366, Helsingfors.
Cemistoma adenocarpella, Staud. B. E. Z. 1870, p. 324, Old Castile.
Bucculatrix luteiciliella, Tengstr. l. c. p. 366, Aboa.
Opogona panchaliella, Staud. B. E. Z. 1870, p. 325, Sarepta.
Nepticula promissa, Staud. l. c. p. 325, Ardèche.
Micropteryx isobasella (? *calthella*, var. *b.*, Zell.), Macugnaga; *M. completella*, Sardinia: Staud. l. c. p. 289. *M. wockei*, Staud. Hor. Ent. Ross. vii. p. 231, pl. 3. f. 5, Greece.

PTEROPHORIDÆ.

On *Pterophorus aridus* and *serotinus*, Zell., see Knaggs, Ent. Ann. 1871, pp. 93, 94. See also C. S. Gregson, Ent. M. M. vii. p. 88.

KNAGGS publishes a list of the Plume-moths (18 out of 29 British species) occurring in the neighbourhood of Folkestone. (List of *Macro-Lepidoptera* of Folkestone, pp. 11, 12.)

Pterophorus (Platyptilus) farfarellus, Zell. Habits and transformations fully described by Zeller, S. E. Z. 1870, pp. 310–315.

Pterophorus periscelidactylus, Fitch. Transformations figured and described, Amer. Ent. ii. pp. 234, 235.

New species:—

Pterophorus calcarius, *P. parthicus*, *P. decipiens*, *P. caspius*, Astrabad, Lederer, Hor. Ent. Ross. viii. pp. 26, 27, pl. 2. f. 15–18; *P. nolkeni*, Tengstr., Fauna et Flora Fenn. Förh. x. p. 366, Karelia; *P. cinnamomeus* and *P. rhy-podactylus*, Sarepta, Staud. B. E. Z. 1870, pp. 326, 327.

Acipitilus phlomidis, Smyrna, Staud. Hor. Ent. Ross. vii. p. 282, pl. 3. f. 19.

DIPTERA

By G. H. VERRALL.

BERGENSTAMM, JULIUS v. Ueber die Metamorphose von *Platypeza holosericea*, Meig. Verh. z.-b. Wien, xx. pp. 37, 38, Taf. iii. A.

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CORNALIA, E. L'Ugi o il Parassito del Filugello al Giappone (*Ugimyia sericariæ*, Rondani). Bull. Soc. Ital. ii. pp. 217-227, tav. iii. figs. 1-22.

HEYDEN, C. L. v. Foss. Dipteren aus der Braunkohle der Siebengebirge (mit 2 Taf.). Cassel. 4to.

LOEW, H. Beschreibungen europäischen Dipteren. Band ii. Heft 1. Halle: 1870, 8vo.

A further portion of the work noticed last year (Zool. Rec. vi. p. 418). In it 102 species are described, nearly all of which are new. The Recorder has not seen a copy, but has been informed by the author of the names of the species and their arrangement.

——. Ueber die von Herrn Dr. G. Seidlitz in Spanien gesammelte Dipteren. B. E. Z. xiv. pp. 137-144.

A list of species collected as above, five of which are new. Two others also described were noticed last year (Zool. Rec. vi. p. 442).

——. Revision der *Calobata*-Arten der europäischen Fauna. B. E. Z. xiv. pp. 209-212.

——. Entomologische Reise nach dem südlichen Spanien. Diptera. B. E. Z. xiv. Beih. pp. 211, 212.

Many notes on Spanish *Diptera* also occur in the body of this work.

——. Ueber die bisher auf der Galizischen Seite des Tetragebirges beobachteten Dipteren. JB. gel. Gesells. Krak. xli. pp. 18*.

It contains a catalogue of Diptera, pp. 4-10, from the locality mentioned, with diagnoses of eight new species, pp. 17 & 18, which are fully described in the author's large work above noticed. Many of the remarks on synonymy (pp. 11-17) are valuable.

——. Bemerkungen über einige *Scatopse*-Arten. Z. ges. Naturw. xxxv. pp. 1-8.

——. *Lobioptera speciosa*, Meig., und *decora*, nov. sp. Z. ges. Naturw. xxxv. pp. 9-14.

——. Revision der europäischen *Pachygaster*-Arten. Z. ges. Naturw. xxxv. pp. 257-271.

Professor Loew has also described some Diptera from Turkestan in 'Schriften der. k. Ges. der Freunde der Natur zu Moskau' for 1870. The species which are included in this Record, under 'Nachr. Ges. Mosc.,' from a list sent by the author, will be again described in the next part of his large work.

* The Recorder has received a "Sonderabdruck" of this paper, which is paged 1-20; the references, therefore, in the Record refer only to this paging.

LOWNE, B. T. The Anatomy and Physiology of the Blow-fly.
London: 1870, 8vo, pp. viii & 121, with 10 plates.

A most exhaustive work on the common Blow-fly (*cf.* Stud. 1870, pp. 28–36).

MÜLLER, ALBERT. A preliminary account of *Cecidomyia dorycnii*, spec. nova, and of *Callimone dorycnicola*, spec. nova, its parasite. Ent. M. M. vii. pp. 76, 77.

RONDANI, CAMILLO. Ortalidinæ Italicæ, collectæ, distinctæ et in ordinem dispositæ. (Dipterologiæ Italicæ prodromi pars vii. fasc. 4.) Bull. Ent. Ital. ii. pp. 5–31, 105–133.

On *Trypetinæ* only, giving an analytical table of genera, and notes and descriptions of numerous species.

——. Sul Insetto Ugi. Bull. Ent. Ital. ii. pp. 134–137.

On the parasite of the Silkworm in Japan.

——. Diptera Italica non vel minus cognita descripta aut annotata. Fasc. iv. Addenda Anthomyinis, Prodr. vol. vi. Bull. Ent. Ital. ii. pp. 317–337.

SACKEN, BARON OSTEN-. Biological Notes on Diptera (article 2nd). Tr. Am. Ent. Soc. iii. p. 51.

THOMSON, C. G. Kongliga Svenska Fregatten Eugenie's Resa omkring Jorden. Vetenskapliga Iakttagelser, ii. Zoologi. 1. Insekta. Häft 12. *Diptera*. pp. 443–614, Tafl. ix. 4to. Stockholm: 1868.

The *Diptera* described in this work number 319, all but three or four of which are considered new; but as the author very rarely refers to works published within the last twenty years, and as Schiner's *Diptera* of the 'Novara' voyage appeared in the same year, it is to be feared that many are only synonyms. Several large old genera, which have been broken up in recent years, he accepts "*sensu latissimo*."

——. Æfversigt af de i Sverige funna arter af slägtet *Pipunculus*. Opusc. Ent. pp. 109–124.

VAN DER WULP, F. M. Opmerkingen omtrent uitlandsche *Asiliden*. Tijd. Ent. (2) vi. pp. 207–217.

——. *Psilopus flexus*, Löw. Tijd. Ent. (2) vi. pp. 227, 228.

VERRALL, G. H. List of British *Syrphidæ*. Ent. M. M. vi. pp. 173–176.

——. On the British species of *Chilosia*. Ent. M. M. vi. pp. 203–207.

——. On the British species of *Platychirus*, including four species new to Britain. Ent. M. M. vii. pp. 127–130.

WAGNER, Dr. B. Die Made von *Eristalis arbutorum*, L., als Parasit im menschlichen Darmkanale. S. E. Z. xxxi. pp. 78-80.

WALSH, B. D. Larvæ in the human bowels. Amer. Ent. ii. p. 137.

WEYENBURGH, Jun., H. Nederlandsche Diptera in Metamorphose en Levenswijz. III. & IV. Tijdschr. Ent. (2) v. pp. 190-205, tav. 7, 8.

WINNERTZ, JOHN. *Heteropeza* und *Miastor*. Verh. z.-b. Wien, xx. pp. 3-8, Taf. i. A, B.

———. Die Gruppe der *Lestremi*næ. Verh. z.-b. Wien, xx. pp. 9-36, Taf. i. c, ii.

The descriptions of new species in Rondani's paper, in 1869, on the fertilization of plants by Diptera, are repeated in Bull. Ent. Ital. ii. pp. 58, 59.

A few remarks on Diptera occur in Müller's discourse upon the Darwinian theory. (Translated by Delpino, Bull. Ent. Ital. ii. pp. 228-241, with a plate, tav. i.)

The Brighton and Sussex Nat. Hist. Soc. has published a paper on Diptera and their wings, by Mr. Peake.

GIEBEL, Z. ges. Naturw. xxxv. p. 87, remarks on some insects sent by Dr. Schreiber, and found in amber, amongst which he mentions having seen several Diptera, one resembling a *Criorhina*, a *Chrysotus*, a *Porphyrops*, and other *Dolichopodidæ*, some *Cecidomyidæ* allied to *Campylomyza*, and some *Mycetophilidæ*.

WALLENGREN, Cefv. Sv. Acad. 1870, pp. 171-180, notices the addition of 128 known species of Diptera to the Swedish fauna.

CECIDOMYIDÆ.

MÜLLER, Ent. M. Mag. vii. p. 39, notes that *Cec. chamædry*s, Inebald, 1860, = *C. veronica*, Bremi, 1847; *C. achilleæ*, Ineb., = *C. millefolii*, Lw. 1850; *C. sp. ?*, Ineb. (economy), = *C. floricola*, Winn. 1853. He also, l. c. p. 88, calls attention to the leaf-folding species and, p. 89, to the habit the larva of *C. terminalis*, Lw., has of pruning the top shoots of *Salix fragilis*.

The same author, l. c. p. 76, describes the egg and gall of a new species (*C. dorycnii*).

WINNERTZ, Verh. z.-b. Wien, xx. pp. 3-8, monographs the genera *Heteropeza* (Taf. i. A. f. 1-5) and *Miastor* (Taf. i. B. f. 1-6), and also the *Lestremi*næ, l. c. pp. 9-36, including the genera *Campylomyza* (Taf. i. c. f. 1-10), *Micromyia* (Taf. ii. A. f. 1-5); *Catocha* = *Macrostyla*, Winn. (Taf. ii. B. f. 1-4), and *Lestremia*, = *Cecidogona*, Lw., = *Mimosciara*, Rond. (Taf. ii. c. f. 1-6). In *Campylomyza*, though he describes 22 new species, he is unable to identify any of the 10 previously described.

SACKEN, Tr. Amer. Ent. Soc. ii. p. 151, describes the very large gall of a species of *Asphondylia* found on the flower of *Rudbeckia triloba*?, and gives some characters of *A. helianthi-globulus*, Walsh.

RILEY, Amer. Ent. ii. p. 244, figures the gall of a new *Cecidomyia* found on *Taxodium distichum*, Richard.

Miastor hospes, sp. n., Winn. Verh. z.-b. Wien, xx. p. 6, Taf. i. B. f. 2.

Asphondylia rudbeckiæ-conspicua, sp. n., O.-Sacken, Tr. Am. Ent. Soc. iii. p. 151, Pennsylvania.

Cecidomyia cupressi-ananassa, sp. n., Riley, Amer. Ent. ii. p. 244, Tennessee.

Campylomyza æqualis, *albicauda*, *analis*, *antennata*, *flavicoxa*, *flavida*, *flavi-ventris*, *fusca*, *fuscinervis*, *kollari*, *lepida*, *munda*, *obscura*, *perpusilla*, *picea*, *pumila*, *rudis*, *squalida*, *sylvicola*, *valida*, *vittata*, *vivida*: spp. nn., Winn. l. c. pp. 12-23.

Lestremia defecta, sp. n., Winn. l. c. p. 33.

NB. Winnertz gives no localities, but leaves it to be understood that they all occur at Crefeld.

New galls (= names given without sufficient knowledge of the perfect insect):—

Cecidomyia (*Asphondylia*) *dorycnii*, Müller, Ent. M. M. vii. p. 76, Mentone.

Cecidomyia sambuci-umbellicola, *caryæ-nucicola*, *tiliæ-citrina*, and *quercus-majalis*, O.-Sacken, Tr. Am. Ent. Soc. iii. p. 151.

MYCETOPHILIDÆ.

PERRIS, Ann. Soc. Ent. Fr. 1870, pp. 188, 189, describes the economy of *Mycetobia pallipes*, Meig., the larva of which is often found in company with that of a *Xylota*, and of *Rhyphus fenestralis*.

Sciara (*Molobrus*) *mærens*, sp. n., Thoms. Eugen. Resa (1868), p. 449, Cape of Good Hope.

Macrocera fascipennis, sp. n., Thoms. l. c. p. 448, Patagonia.

Asyndulum brevimanum, no. 17, Germany; *halidayi*, no. 18, Italy, Rhodes: spp. nn., Loew, Bes. eur. Dipt. ii. H. 1.

BIBIONIDÆ.

LOEW (Z. ges. Naturw. xxxv. pp. 1-9) criticises some species of *Scatopse*, especially *transversalis*, Lw.; *soluta*, Lw., and *inermis*, Ruthé, which he distinguishes; *infumata*, Hal., = *fuscinervis*, Lw. ?; and *infumata*, Wlk. (*nec* Haliday); this last he tries to identify with *nigripennis*, Mg., *annulipes*, v. Roser, *geniculata*, Zett., or *pulicaria*, Zett. (*nec* Loew).

The remarks on *S. soluta* and *inermis* also occur in Gel. Ges. Krak. xli. Sonderabd. p. 11; and Loew there states that *Bibio nigri-ventris*, Hal., is distinct from *albipennis*, Mg., with which Walker had united it.

Scatopse lucifuga, sp. n., Lw. Z. ges. Naturw. xxxv. p. 2, Germany (= *transversalis*, Mik).

Bibio furcillatus, no. 21, Siberia; *lepidus*, no. 20, England, Ireland: spp. nn., Lw. Bes. eur. Dipt. ii. H. 1.

SIMULIDÆ.

GREEN calls attention, Trout Culture, p. 92 [American], to the fact that young trout and whitefish are killed by the web spun by the larva of *Simulium piscicidium*, n. sp.

RILEY, Amer. Ent. ii. p. 227, notices the same fact, which M'BRIDE, l. c. p. 365, denies entirely.

OSTEN-SACKEN, *l. c.* p. 229, writes on the transformations of a *Simulium* found at Washington (with figures).

Simulium piscicidium, sp. n., Riley, Amer. Ent. ii. p. 366.

CHIRONOMIDÆ.

Chironomus trochanteratus, sp. n., Thoms. Eugen. Resa (1868), p. 445, Manilla.

Ceratopogon trichopus, sp. n., Thoms. *l. c.* p. 444, China.

CULICIDÆ.

In the translation by DELFINO (of Müller's discourse in 1869 on the Darwinian theory) in Bull. Ent. Ital. ii. pp. 228–241 are some remarks on the scales on the wings of *Culex*, and a plate (tav. i.).

Culex camptorhynchus, Sydney; *incidens*, California: spp. nn., Thoms. *l. c.* p. 443.

TIPULIDÆ.

MÜLLER, Ent. M. M. vii. p. 60, remarks on the larva of *Tipula oleracea* injuring fields of rye-grass near Croydon.

LOEW, Gel. Ges. Krak. xli. (p. 11) remarks that the species of *Chionea* found near Vienna during the last twenty years is not *C. araneoides*, Dalm., but *crassipes*, Boh. He also objects to Dalman's name *araneoides*, and proposes to use in future *C. dalmani*.

Loew, Bes. eur. Dipt. ii. H. 1, redescribes *Rhipidia uniseriata*, Schin., and *Idioptera trimaculata*, Zett.

Cenarthria, g. n., Thoms. Eugen. Resa, p. 445 (1868). Allied to *Gynoplistia*. *C. viridis*, sp. n., Thoms. *l. c.* p. 446, tab. ix. f. 1, Sydney.

Limnobia fascipennis, Thoms., *microcephala*, Sydney: spp. nn., Thoms., *l. c.* pp. 446–447.

Rhipidia ctenophora, sp. n., Lw. Bes. eur. Dipt. ii. H. 1, no. 3, Germany.

Dicranoptycha livescens, sp. n., Lw. *l. c.* ii. H. 1, no. 1, Galicia.

Erioptera gracilipes, sp. n., Lw. *l. c.* ii. H. 1, no. 6, Galicia.

Erioptera longicauda, no. 7; *macrophthalma*, no. 5; *squalida*, no. 4: spp. nn., Lw. *l. c.* ii. H. 1, Germany.

Trichocera versicolor, sp. n., Lw. *l. c.* ii. H. 1, no. 12, Sarepta.

Dicranota subtilis, sp. n., Lw. *l. c.* ii. H. 1, no. 13, Galicia.

Ephelia spoliata, sp. n., Lw. *l. c.* ii. H. 1, no. 10, Germany.

Ephelia apicata, no. 8, *mundata*, no. 9, spp. nn., Lw. *l. c.* ii. H. 1, Galicia.

Pachyrrhina aculeata, sp. n., Lw. *l. c.* ii. H. 1, no. 14, Galicia.

Ctenophora amena, no. 15, Siberia; *fastuosa*, no. 16, Varna: spp. nn., Lw. *l. c.* ii. H. 1.

Dixa guttipennis, sp. n., Thoms. Eugen. Resa, p. 448 (1868), China.

Orphnephila nigra, sp. n., Lw. *l. c.* ii. H. 1, no. 19, Galicia.

All the species from Galicia are also diagnosed by Loew, Gel. Ges. Krak. xli. pp. 17, 18.

STRATIOMYIDÆ.

LOEW, Z. ges. Naturw. xxxv. pp. 257–272, criticises the European species of *Pachygaster*, enumerating *ater*, Pz., = *Sargus pachygaster*, Fall. pt.; *tarsalis*, Zett., = *robustus*, Jaen.; *meromelas*, L. Duf., = *Sargus pachygaster*, Fall.

pt., = *orbitalis*, Whlbg., = *argentifer*, Jaen.; *leachii*, Curt., = *pallipennis*, Mcq., = *pallidipennis*, Meig.; *minutissimus*, Zett., = *tenellus*, Jaen. At the end he gives an analytical table of these species.

Brachycara, gen. nov., Thoms. Eugen. Resa, p. 460 (1868). Allied to *Chrysomyia*. *B. ventralis*, sp. n., Thoms. l. c. p. 461, tab. ix. f. 4, Rossi I.

Hadrestia, gen. nov., Thoms. l. c. p. 453. Allied to *Beris*. *H. aenea*, sp. n., Thoms. l. c. p. 454, tab. ix. f. 3, Patagonia.

Nemotelus æmulus, no. 32, *atriceps*, no. 33, *latiusculus*, no. 29, *pulkus*, no. 34, and *pulcher*, no. 31, Spain; *modestus*, no. 30, Naxos; *varius*, no. 35, Corfu: spp. nn., Lw. Bes. eur. Dipt. ii. H. 1.

Nemotelus albiventris, sp. n., Thoms. l. c. p. 462, Manilla.

Oxycera varipes, sp. n., Lw. B. E. Z. xiv. Beih. p. 211, Spain.

Stratiomyia lugubris, no. 22, Siberia; *nobilis*, no. 23, Turkestan: spp. nn., Lw. Bes. eur. Dipt. ii. H. 1.

Odontomyia claripennis, *ochropa*, Manilla; *fenestrata*, Buenos Ayres; *foveifrons*, Rio Janeiro; *obscuripes*, *stigmaticalis*, Puna; *pectoralis*, Sydney: spp. nn., Thoms. l. c. pp. 455–458.

Phyllophora bispinosa, sp. n., Thoms. l. c. p. 454, Manilla.

Chrysoclora fasciata, Galapagos; *frontalis*, Taiti: spp. nn., Thoms. l. c. pp. 459, 460.

Chrysomyia annulipes, sp. n., Thoms. l. c. p. 461, Manilla.

TABANIDÆ.

LOEW, Gel. Ges. Krak. xli. (p. 12) considers *Hæmatopota crassicornis* Whlbg., distinct from *H. pluvialis*, L.

RILEY, Second Ann. Rep. Ins. Miss. p. 128, describes and figures the larva and perfect insect of *Tabanus atratus*, Fabr.

PACKARD, A. S., jun., 'Injurious Insects,' p. 24, describes and figures the pupa of *Tabanus atratus*, Fabr.

Cænomyia, gen. nov., Thoms. Eugen. Resa, p. 449 (1868), = *Pelecorhynchus*, Macq. ? *C. maculipennis*, sp. n., Thoms. l. c. p. 450, tab. ix. f. 2, Sydney.

Hæmatopota pallens, sp. n., Lw. Bes. eur. Dipt. ii. H. 1, no. 36, Turkestan.

Tabanus vittiger, sp. n., Thoms. l. c. p. 451, Galapagos.

Chrysops clavicornis, sp. n., Thoms. l. c. p. 452, Malacca.

Pangonia nigrosignata, sp. n., Thoms. l. c. p. 451, Sydney.

LEPTIDÆ.

Chrysopila dives, sp. n., Lw. Bes. eur. Dipt. ii. H. 1, no. 37, Siberia.

THEREVIDÆ.

Thereva ochropa, sp. n., Thoms. Eugen. Resa, p. 477 (1868), Sydney.

Psilocephala formosa, no. 1, and *mendicula*, no. 2, Turkestan: spp. nn., Lw. Nachr. Ges. Mosc.

Anabarhynchus bohemani, *kinbergi*, Sydney: spp. nn., Thoms. l. c. pp. 478, 479.

ACROCERIDÆ.

LOEW redescribes, Bes. eur. Dipt. ii. H. 1, no. 38, *Opsebius inflatus*, Lw.

Mesophysa australiæ, sp. n., Thoms. Eugen. Resa, p. 475 (1868), Sydney.

Opsebius formosus, sp. n., Lw. Bes. eur. Dipt. ii. H. 1, no. 39, South France.

Opebius pepo, sp. n., Lw. B. E. Z. xiv. Beih. p. 211, and Bes. eur. Dipt. ii. H. 1, no. 40, Spain.

BOMBYLIIDÆ.

Exoprosopa dedecor, no. 3, *nubeculosa*, no. 4, Turkestan: spp. nn., Lw. Nachr. Ges. Mosc.

Exoprosopa albiventris, *macraspis*, spp. nn., Thoms. Eug. Resa, pp. 479, 480 (1868), Sydney.

Anthrax stenucus, no. 5, *subarcuatus*, no. 6, Turkestan: spp. nn., Lw. l. c.

Anthrax angularis, *consimilis*, Sydney; *brachialis*, *curvirostra*, *tincta*, *lateralis*, Galapagos; *leptopa*, Mauritius; *nudiuscula*, *quinquepunctata*, Panama: spp. nn., Thoms. l. c. pp. 481-484.

Cyllenia globiceps, sp. n., Lw. l. c. no. 11, Turkestan.

Amictus insignis, no. 7, *nobilis*, no. 8, Turkestan: spp. nn., Lw. l. c.

Tomomyza tenella, sp. n., Lw. B. E. Z. xiv. p. 142, Spain.

Comptosia albofasciata, *anthracina*, *calophthalma*, spp. nn., Thoms. l. c. pp. 484, 485, Sydney.

Bombylius lobalis, *punctipennis*, *pyncnorhynchus*, *scutellaris*, *spinipes*, spp. nn., Thoms. l. c. pp. 486-488, Sydney.

Ploas adunca, no. 9, *luctuosa*, no. 10, Turkestan: spp. nn., Lw. Nachr. Ges. Mosc.

NEMESTRINIDÆ.

Nemestrina innotata, no. 42, *mollis*, no. 41, Turkestan, sp. nn., Lw. Bes. eur. Dipt. ii. H. 1.

Trichophthalma bivittata, *fuscipennis*, *ochropa*, *tabanina*, spp. nn., Thoms. Eug. Resa, pp. 476, 477, Sydney.

MYDASIDÆ.

Harmophana, gen. nov., Thoms. Eugen. Resa (1868), p. 462, tab. ix. f. 5 [= *Triclonus*, Gerst. ? 1868]. Sp. *Mydas clavata*, Macq. [= *bispiniifer*, Westw.] and *H. flavipes*, sp. n., Thoms. l. c. p. 463.

ASILIDÆ.

VAN DER WULP, Tijd. Ent. (2) v. pp. 206-217, remarks on several species of *Asilidæ*, especially Wiedemann's types in the Leyden Museum, as follows:—*Dasypogon spectrum*, W., = *Microstylus*; *D. nomada*, W., and *Histrio*, W., = *Scylaticus*; *Asilus hercules*, W., may = *Ommatius*; *A. longistylus*, W., = *Itamus*; *Laphria robusta*, W., = *Hyperechia*; *L. scapularis*, W., may = *Aphestia*. His own species, *Dasypogon laticeps*, = *Discocephala*. He recharacterizes Jaennicke's genus *Doryclus*. He also says *Laphria shalumus*, Wlk., = *Microstylus dux*, W.

LOEW, Bes. eur. Dipt. ii. H. 1, redescribes *Cyrtopogon centralis*, Lw., no. 61, and *Proctacanthus gigas*, Eversm., no. 69.

RILEY, Second Ann. Rep. Ins. Miss. p. 121, describes and figures the larva, pupa, and adult of *Erax bastardi*.

PACKARD, Injurious Insects, p. 22, describes and figures the pupa of *Proctacanthus philadelphicus*, which burrows in the sand at Plum Island, Mass.

Cænarolia, gen. nov., Thoms. Eugen. Resa, p. 470 (1868). Allied to *Leptogaster* [= *Euscelidia*, Westw. ?]. *C. longipennis*, sp. n., p. 471, Taf. ix. f. 6, Rio Janeiro.

Leptogaster fumipennis, no. 44, Greece; *helvolus*, no. 45, Turkestan; *pubiceps*, no. 46, Greece, Sarepta: spp. nn., Lw. Bes. eur. Dipt. ii. H. 1.

Holopogon binotatus, sp. n., Lw. B. E. Z. xiv. p. 139, Spain.

Holopogon digrammus, no. 57, Sarepta; *imbecillus*, no. 56, Turkestan: spp. nn., Lw. Bes. eur. Dipt. ii. H. 1.

Holopogon heydenii, sp. n., Lw. B. E. Z. xiv. Beih. p. 211, and Bes. eur. Dipt. ii. H. 1, no. 55, Spain.

Heteropogon erinaceus, sp. n., Lw. l. c. p. 211, and Bes. eur. Dipt. ii. H. 1, no. 58, Portugal.

Cyrtopogon filicornis, no. 62, *leucomelas*, no. 63, Turkestan; *pulchripes*, no. 60, Siberia: spp. nn., Lw. Bes. eur. Dipt. ii. H. 1.

Stenopogon costatus, sp. n., Lw. B. E. Z. xiv. Beih. p. 212, and Bes. eur. Dipt. ii. H. 1, no. 53, Spain.

Stenopogon pyrrhus, sp. n., Lw. Bes. eur. Dipt. ii. H. 1, no. 52, Turkestan.

Stenopogon ochraceus, sp. n., V. d. Wulp, Tijdschr. Ent. ser. 2, v. p. 212, pl. 9. f. 6, N. America.

Scleropogon porcus, sp. n., Lw. Bes. eur. Dipt. ii. H. 1, no. 51, Turkestan.

Stichopogon riparius, sp. n., Lw. l. c. no. 59, Spain.

Habropogon latifrons, sp. n., Lw. l. c. no. 54, Turkestan.

Dioctria pollinosa, sp. n., Lw. B. E. Z. xiv. p. 138, and Bes. eur. Dipt. ii. H. 1, no. 49, Spain.

Dioctria arthritica, no. 48, Shumla; *dispar*, no. 46, Turkestan; *nigribarba*, no. 47, Varna: spp. nn., Lw. Bes. eur. Dipt. ii. H. 1.

Dasyopogon lenticeps, sp. n., Thoms. l. c. p. 464, Cape of Good Hope.

Saropogon dasynotus, sp. n., Lw. Bes. eur. Dipt. ii. H. 1, no. 50, Turkestan.

Codula vespiformis, sp. n., Thoms. l. c. p. 464, Sydney.

Dorychus latipes, sp. n., V. d. Wulp, l. c. p. 215, pl. 9. f. 7-12, Surinam.

Atomosia virescens, sp. n., Lw. l. c. ii. H. 1, no. 64, Sarepta.

Atomosia limbiventris, p. 466, Montevideo; *pilipes*, p. 465, Buenos Ayres: spp. nn. Thoms. l. c.

Laphistia latiuscula, sp. n., Lw. l. c. ii. H. 1, no. 65, Turkestan.

Dasythrix ramucosa, sp. n., Lw. l. c. no. 66, S. Russia.

Mallophora cæruleiventris, Callao; *soccata*, Buenos Ayres: spp. nn., Thoms. l. c. p. 467.

Philodicus leontochlenus, no. 67, *spectabilis*, no. 68, Turkestan: spp. nn., Lw. l. c. ii. H. 1.

Erax plantaris, sp. n., Thoms. l. c. p. 468 (1868), Sydney.

Proctacanthus epilogaster, sp. n., Thoms. l. c. p. 469, Sydney.

Asilus albispinus, sp. n., Thoms. l. c. p. 470, Manilla.

Asilus missouriensis, sp. n., Riley, Second Ann. Rep. Ins. Miss. p. 121 (fig.), Missouri.

Antipalus kriperi, sp. n., Lw. l. c. ii. H. 1, no. 74, Greece.

Eccoctopus erythrogastrus, sp. n., Lw. l. c. no. 73, Spain.

Philonicus elatus, sp. n., Lw. l. c. no. 70, S. France.

Antiphrisson elachipterus, no. 72, Sarepta; *fuliginus*, no. 71, S. Russia: spp. nn., Lw. l. c.

Lophonotus acutus, sp. n., Lw. B. E. Z. xiv. p. 140, Spain.

Protophanes atticus, sp. n., Lw. Bes. eur. Dipt. ii. H. 1, no. 75, Greece.

Dysmachus acutus, no. 76, *atripes*, no. 79, *dasynotus*, no. 78, *femoratellus*, no. 80, *spurius*, no. 77, Spain; *bilobus*, no. 82, Hungary, Sarepta; *cephalenus*, no. 81, *dasyproctus*, no. 84, Corfu; *stenogastus*, no. 83, Turkestan: spp. nn., Lw. l. c.

Mochtherus eulabes, no. 100, *farinosus*, no. 101, Turkestan; *lepidus*, no. 99, Spain; *tridentatus*, no. 102: spp. nn., Lw. l. c.

Itamus macrophthalmus, no. 96, *univittatus*, no. 98, Siberia; *socius*, no. 97, Scandinavia, Germany, Galicia: spp. nn., Lw. l. c.

Machimus concinnus, sp. n., Lw. B. E. Z. xiv. p. 140, Spain.

Machimus graciosus, no. 95, Smyrna; *oophorus*, no. 92, *subdolos*, no. 94, Spain; *stenolabes*, no. 93, Greece: spp. nn., Lw. Bes. eur. Dipt. ii. H. 1.

Eutolmus græcus, no. 89, Greece; *hispanus*, no. 91, *hyalopterus*, no. 85, *leucacanthus*, no. 86, Spain; *immaculatus*, no. 88, *implacidus*, no. 87, Turkestan; *mollis*, no. 90, Crete: spp. nn. Lw. l. c.

EMPIDÆ.

LOEW, JB. gel. Ges. Krak. xli. (p. 12), says:—*Rhamphomyia gracilipes*, Lw., ♂ = *R. squamigera*, Lw., ♀ = *R. geniculata*, Zett. (Mg. ♀), = *R. fimbriatipes*, Now.; also *R. tibiella*, Zett., = *R. simulum*, Now. He also says Macquart's genus *Platypalpus* (to which word he objects) = the major portion of Meigen's genus *Tachydromia*, for which the name should therefore be preserved; also that Meigen's genus *Tachypeza* = Macquart's *Tachydromia*.

NOWICKI, Gel. Ges. Krak. xli. (p. 19), makes some remarks on the genus *Microphorus*.

Empis abrupta, Cape of Good Hope; *cozalis*, *lobalis*, Patagonia; *tenuirostris*, Sydney: spp. nn., Thoms. Eugen. Resa, pp. 471-473.

Hilara brachyrhyncha, *holosericea*, Patagonia: spp. nn., Thoms. l. c. pp. 473, 474.

Microphorus zontaki, sp. n., Nowicki, Gel. Ges. Krak. xli. (p. 20), Galicia.

Hemerodromia analis, sp. n., Thoms. l. c. p. 474, Patagonia.

DOLICHOPODIDÆ.

VAN DER WULP, Tijd. Ent. (2) vi. p. 227, adds considerably to Loew's description of *Psilopus flexus* (made from an incomplete female), and figures it in pl. ix. f. a, b.

Anchineura, gen. nov., Thoms. Eugen. Resa, p. 506 (1868). Allied to *Psilopus* [in the plate the cubital vein is not forked]. *A. tibialis*, sp. n., Thoms. l. c. p. 507, Taf. ix. f. 8, Galapagos.

Psilopus curviseta, Taiti; *leptogaster*, Mauritius; *macropus*, *patellifer*, Guam; *muticus*, Keeling Isle; *pleuralis*, *zonatulus*, Puna: spp. nn., Thoms. l. c. pp. 508-510.

Hercostomus blepharopus, no. 19, *pallidus*, no. 18, Turkestan: spp. nn., Lw. Nachr. Ges. Mosc.

Dolichopus brevisculus, no. 13, *perversus*, no. 12, Turkestan: spp. nn., Lw. l. c.

Dolichopus aurifer, *canaliculatus*, *metatarsalis*, *lamellicornis*, California: spp. nn., Thoms. l. c. pp. 511, 512.

Tachytrechus petræus, no. 16, *sogdianus*, no. 17, Turkestan: spp. nn., Lw. l. c.

Gymnopternus aberrans, no. 14, *clarus*, no. 15, Turkestan: spp. nn., Lw. l. c.

Medeterus [= *Hydrophorus*] *breviseta*, sp. n., Thoms. l. c. p. 510, California.

Thinophilus pollinosus, sp. n., Lw. l. c. no. 20, Turkestan.

Teuchophorus bisetus, sp. n., Lw. l. c. no. 23, Turkestan.

Sympycnus speciosus, sp. n., Lw. l. c. no. 24, Turkestan.

Medeterus lamptostomus, sp. n., Lw. l. c. no. 25, Turkestan.

Chrysotus nigricilius, sp. n., Lw. l. c. no. 22, Turkestan.

Chrysotus ochropus, sp. n., Thoms. l. c. p. 505, Puna.

Asyndetus albipalpus, sp. n., Lw. l. c. no. 21, Turkestan.

Diaphorus exunguis, Buenos Ayres; *virescens*, Taiti: spp. nn., Thoms. l. c. p. 506.

PHORIDÆ.

Phora consanguinea, sp. n., Lw. Nachr. Ges. Mosc. no 33, Turkestan.

SYRPHIDÆ.

HENSEL, B. E. Z. xiv. pp. 135, 136, adds 91 species to a list of those occurring near Berlin (v. B. E. Z. viii.).

WAGNER records, S. E. Z. xxxi. pp. 78-80, the occurrence of the larva of *Eristalis arbustorum*, L., as a parasite in human intestines.

LOEW, JB. gel. Ges. Krak. xli. (p. 16), contends that *Syrphus emarginatus*, Zett. [meaning *excisus*, Zett.], is distinct from *S. abbreviata*, Zett. (1848), but that the latter = *S. affinis*, Lw. (1840). He will not sink his name *affinis*, because of a prior *Scæva affinis*, Fab., as in the Syst. Antliat. Fabricius has called his species a *Thereva* [he, however, seems to overlook Say's *Scæva affinis*, 1823]. He also says *Syrphus lapponicus*, Zett., is distinct from *S. arcuatus*, Fall., but doubts whether *Xylota cæruleiventris*, Zett., may not be a variety of *X. nemorum*, F.

VERRALL, Ent. M. M. vi. pp. 173-176, has published a list of British *Syrphidæ*, and subsequently, l. c. pp. 203-207, has given short descriptions of the British *Chilosia*, including 23 species, and, l. c. vii. pp. 127-130, of the British *Platychiri*, 11 species, including 4 (*P. melanopsis*, *angustatus*, *podagratus*, and *scambus*) omitted from the previous list.

VERRALL, Ent. vi. Feb. 1870, has given short notes on the species of *Syrphidæ* in the collection of the Entomological Club.

RILEY, Amer. Ent. ii. p. 142, gives in a note a brief account of the habits of several *Syrphi*, figuring *Helophilus latifrons*, Loew, *Scæva philadelphica*, Mcq., and the larva of the latter from Illinois.

Glaurotricha, gen. nov., Thoms. Eugen. Resa, p. 493 (1868). Allied to *Chilosia*. G. [errore *Haurottricha*] *muscaria*, sp. n., Thoms. l. c. p. 493, T. ix. f. 7, Buenos Ayres.

Baccha facialis, sp. n., Thoms. l. c. p. 504, Galapagos.

Syrphus brachypterus, Madeira; *fumipennis*, *infumatus*, *limbiventris*, *sulphuripes*, *trichopus*, California; *heterogaster*, *macropterus*, *pleuralis*, China; *macrogaster*, Sydney; *melanogaster*, Rio Janeiro; *nodalis*, Taiti; *ochrogaster*, *quadrigeminus*, Buenos Ayres; *porticola*, Callao, Puna; *splendens*, Galapagos: spp. nn., Thoms. l. c. pp. 494-502.

Chilosia nowickii, sp. n., Lw. JB. gel. Ges. Krak. xli. (p. 18), Galicia.

Eristalis foveifrons, Buenos Ayres; *sinuata*, Sydney; *temporalis*, California; *ventralis*, China: spp. nn., Thoms. l. c. pp. 488-491.

Syrirta armipes, Cape of Good Hope; *spinigerella*, St. Helena: spp. nn., Thoms. l. c. pp. 502, 503.

Paragus crenulatus, sp. n., Thoms. l. c. p. 503, China.

Orthoprosopa binotata, sp. n., Thoms. l. c. p. 492, Sydney.

Mixogaster aphritinus, sp. n., Thoms. l. c. p. 491, Sydney.

PIPUNCULIDÆ.

THOMSON, Opus. Ent. pp. 109-124, gives a review of the Swedish species of *Pipunculus*, of which he considers *Cephalops*, Fall., and *Chalarus*, Wlk., to be subgenera. He describes in Latin 25 species, 3 of which he considers new to science.

Pipunculus abscissus, *armatus*, China, spp. nn., Thoms. Eugen. Resa, pp. 513, 514 (1868).

Pipunculus xanthopus, *terminalis*, *pulchripes*, Sweden, spp. nn., Thoms. Opusc. Ent. pp. 111-117.

PLATYPEZIDÆ.

BERGENSTAMM, Verh. z.-b. Wien, xx. pp. 37, 38, Taf. iii. A, describes the metamorphoses of *Platypeza holosericea*, Meig.

CONOPIDÆ.

HENSEL, B. E. Z. xiv. p. 136, adds *C. signatus* to the list of species found near Berlin.

Conops claviventris, sp. n., Thoms. Eugen. Resa, p. 514 (1868), Sydney.

Myopa conjuncta, sp. n., Thoms. l. c. p. 515, California.

MUSCIDÆ.

The arrangement of this family being still in a very unsettled state, the Recorder has thought it best to follow the subfamilies marked out in Schiner's Catalogue of European Diptera. The only alterations adopted are a reversal of their order, as agreed to by Schiner himself in Verh. z.-b. Wien, xviii.; and for temporary convenience the *Ortalinæ* include the genera arranged under that family by Loew.

It will be most convenient to notice here two insects described by Loew in 1870, of which the Recorder has not seen the original descriptions; and as the genera appear to be new, he cannot refer them to their proper subfamilies. They are described in Loew's paper on Diptera from Turkestan in Nachr. Ges. Mosc., and are

Apostrophus suspectus, no. 27, and

Anacampta robusta, no. 29.

Ocypterinæ.

Lophosia setigera, sp. n., Thoms. Eugen. Resa, p. 527 (1868), California.

Tachininæ.

WEYENBURGH, Tijd. Ent. (2) v. p. 201-206, T. 8, gives a full life-history of *Meigenia bombivora*, V. d. Wulp.

RUPERTSBERGER, Verh. z.-b. Wien, xx. p. 842, mentions breeding *Macquartia nitida*, *præfica*, and *trimaculata* from a *Chrysomela*.

RONDANI, 'Nota sugli insetti parassiti della *Galleruca* dell' Olmo,' describes and figures *Erynnia nitida*, R.-Desv. as a parasite of *Galeruca xanthomelena* or *calmariensis* (T. i. f. 1-8).

GUÉRIN-MÉNEVILLE, C. R. lxx. p. 844, remarks upon the fly parasitic upon silkworms in Japan, and proposes for it the name *Tachina oudji*.

RONDANI, Bull. Ent. Ital. ii. p. 137, discourses upon the same parasite, for which, though he had only seen the larva and pupa, he proposed the new generic name of *Ugimyia*, calling the species *U. sericariae*.

CORNALIA, Bull. Ent. Ital. ii. p. 217, tav. iii. f. 1-22, gives a full history of the same parasite, which he describes in all its stages. He adopts Rondani's name for it.

ADAMS also refers to this insect in 'Revue universelle de sériculture, Lyon,' no. 36, April 1870. There are also references to it by RONDANI in 'Bollettino del Comizio Agrario,' April 1870, and GIRARD, "Note relative au parasite appelé Oujî," in Bull. Soc. Acclim. June 1870.

RILEY, Amer. Ent. ii. p. 101, notes the parasitism of *Exorista militaris* on *Platysamia cecropia*, and describes its transformations.

Glaurocara, gen. nov., Thoms. Eugen. Resa, p. 518 (1868). Allied to *Trixa* and *Myobia*. *G. flava*, sp. n., Thoms. l. c. p. 519, T. ix. f. 9, Mauritius.

Ugimyia, gen. nov., Rond. and Cornalia (see above). *U. sericariae*, sp. n., Rond. and Cornalia, Japan.

Echinomyia filipalpis, sp. n., Thoms. Eugen. Resa, p. 577 (1868), California.

Jurinea echinata, sp. n., Thoms. l. c. p. 518, California.

Exorista flavicauda, sp. n., Riley, 2nd Ann. Rept. Ins. Miss. p. 50, Missouri.

Exorista ruficornis, sp. n., Thoms. l. c. p. 520, Rio Janeiro.

Tachina lasiops, sp. n., Lw. Nachr. Ges. Mosc. no. 26, Turkestan.

Tachina albifrons, sp. n., Smith, Tr. E. Soc. 1870.

Masicera flavisetula, Mauritius; *quadrizonula*, St. Helena: spp. nn., Thoms. l. c. pp. 521, 522.

Miltogramma biseta, Panama; *erythroceræ*, California: spp. nn., Thoms. l. c. pp. 523, 524.

Myobia brachyptera, Rio Janeiro; *dasynemis*, Galapagos; *uncinata*, Cape of Good Hope: spp. nn., Thoms. l. c. pp. 525-527.

Thryptocera setinervis, sp. n., Thoms. l. c. p. 519, China.

Chytia spinicosta, sp. n., Thoms. l. c. p. 523, Mauritius.

Degeeria antarctica, Patagonia; *spinicosta*, Manilla: spp. nn., Thoms. l. c. pp. 527, 528.

Dexinæ.

Rutilia albopicta, *pubicollis*, *spinipectus*, spp. nn., Thoms. l. c. pp. 529, 530, Sydney.

Medoria spinicosta, sp. n., Thoms. l. c. p. 522, Mauritius.

Prosenia macropus, sp. n., Thoms. l. c. p. 531, Sydney.

Dinera pallicornis, sp. n., Lw. Nachr. Ges. Mosc. no. 28, Turkestan.

Dinera spinigera, sp. n., Thoms. l. c. p. 531, Cape of Good Hope.

Sarcophaginæ.

Tricharæa, gen. nov., Thoms. Eugen. Resa, p. 540 (1868). Allied to *Sarcophaga*. *T. scatophagina*, sp. n., Thoms. l. c. p. 541, Rio Janeiro.

Sarcophaga aequipalpis, Madeira; *barbata*, *dux*, Honolulu; *pallinervis*, Honolulu, California; *boops*, Cape of Good Hope; *brevispina*, *canescens*, Rio Janeiro; *claripennis*, Mauritius; *despecta*, Puna; *frontalis*, I. Rossi, Manilla; *genalis* (= *parvula*, Wied.?), Brazil; *nobilis*, Monte Video, Buenos Ayres; *obtusifrons*, Galapagos; *occipitalis*, Callao; *ochripalpis*, *pallidus*, Sydney; *spininervis*, Manilla: spp. nn., Thoms. l. c. pp. 533-540.

Microcerella sarcophagina, sp. n., Thoms. l. c. p. 541, Valparaiso.

Catapicephala limbipennis, sp. n., Thoms. l. c. p. 541, Honolulu.

Muscinae.

LOWNE's work on the anatomy and physiology of the Blow-fly, though worked out from a species of this subfamily, is of extreme importance to any person studying the anatomy of any insect.

LOEW, JB. gel. Ges. Krak. xli. (p. 16), believes *Stomoxys melanogaster*, Meig., was described from a rubbed female of *S. stimulans*, Meig.; he says that Schiner, in his 'Fauna Austriaca' has described *S. stimulans* from the male, and *melanogaster* from the female.

Idia pleuralis, sp. n., Thoms. Eugen. Resa, p. 542 (1868), Keelings I.

Musca angustifrons, Ascension I.; *bivittata*, Manilla; *niveisquama*, China, Manilla, Malacca; *converifrons*, China; *flavinervis*, Rossi I., var. from Honolulu; *lastophthalma*, Cape of Good Hope: spp. nn., Thoms. l. c. pp. 546-548.

Lucilia curvipes, Rio Janeiro; *picicrus*, Panama; *porticola*, Callao; *quadrisingnata*, Galapagos; *stigmaticalis*, California; *teniaria* [= *Musca macellaria*, var. *b*, Wied.]: spp. nn., Thoms. l. c. p. 543, 544.

Pyrellia frontalis, sp. n., Thoms. l. c. p. 545, California.

Cyrtoneura 4-setosa, sp. n., Thoms. l. c. p. 549, *recurva*, p. 548, California.

Anthomyiine.

THOMSON, Eugen. Resa, p. 559 (1868), describes a variety of *Cænosiä macularis* from China.

Pogonomyia, gen. nov., Rond. Bull. Soc. Ent. Ital. ii. p. 336. *P. alpicola*, sp. n. (♂ only), Rond. l. c. p. 337, Mont Cenis.

Ytodesia alpina, *manicata*, *vivida*, *semidiaphana*, Piedmont; *insularis*, Sardinia; *nigripalpis*, Apennines: spp. nn., Rondani, l. c. pp. 318-322.

Spilogaster albicornis, Venetia; *lucana*, Parma; *nemorana*, Apennines; *sylvana*, Insubria: spp. nn., Rond. l. c. pp. 322, 323.

Aspiha alpestris, Varallus (Alps); *pubicheta*, Piedmont: spp. nn., Rond. l. c. pp. 317, 318.

Ophyra minima, sp. n., Rond. l. c. p. 317, Alps.

Limnophora albifrons, sp. n., Rond. l. c. p. 325, Piedmont.

Trichophticus armipes, sp. n., Rond. l. c. p. 336, Italy, Mont Cenis.

Hydrophoria interposita, Rond. l. c. p. 325, = *A. linogrisea*, Zett.

Anthomyia figulina, sp. n., Rond. l. c. p. 326, Piedmont.

Anthomyia bisetosa, *lenticeps*, *lobalis*, China; *brevipalpis*, Guayaquil; *cy-clophthalma*, *serrulata*, *tempestatum*, Cape of Good Hope; *idiina*, Taiti; *lanicrus*, *prominula*, Buenos Ayres; *macronycha*, *oogaster*, *platygaster*, Sydney; *micropteryx*, *ochripes*, *ochrogaster*, California; *platystoma*, *quadristigma*, *setinervis*, Puna: spp. nn., Thoms. l. c. pp. 549-557.

Chorthophila grisella, Parma; *hirticrura*, Etruria, Parma; *palpella*, Alps; *rimans*, Appenines: spp. nn., Rond. l. c. pp. 327-329.

Homalomyia carbonaria, sp. n., Rond. l. c. p. 324, Piedmont.

Homalomyia prunivora, *wilsonii* (larva only), Illinois; and *leidy*, spp. nn., Walsh, Amer. Ent. ii. p. 137.

Atherigona soccata, sp. n., Rond. Bull. Ent. Ital. ii. p. 332, Etruria.

Hoplogaster obscuricula, sp. n., Rond. l. c. p. 331, Parma.

Caricea pantherina, sp. n., Rond. l. c. p. 333, Etruria; *pardalina*, 334, Sardinia.

Cœnosia boops, *falcata*, *simplex*, China; *compressiventris*, Malacca; *excisa*, Rossi I.; *latifrons*, Puna; *picicrus*, Manilla; *pipunculina*, Rio Janeiro; *punctipes*, Cape of Good Hope: spp. nn., Thoms. l. c. pp. 557-560.

Lispe grandis, Manilla; *hyalinipennis*, *vittipennis*, China; *metatarsalis*, Honolulu: spp. nn., Thoms. l. c. pp. 561, 562.

Ochthiphilinae.

LOEW, Z. ges. Naturw. xxxv. pp. 9-14, criticises *Lobioptera speciosa*, Mg., of which he considers *margaritata*, Mik, to be only the female.

Oxyrhina binotata, sp. n., Thoms. Eugen. Resa (1868), p. 601, Sydney.

Ochthiphila [= *Schenomyia*] *lispina*, sp. n., Thoms. l. c. p. 599, California.

Ochthiphila guttipennis, Buenos Ayres; *sexnotata*, Cape of Good Hope: spp. nn., Thoms. l. c. p. 600.

Lobioptera decora, sp. n., Lw. l. c. p. 9, Corsica, = *L. speciosa* ♂, Schiner.

Agromyzinae.

LOEW, JB. gel. Ges. Krak. xli. (p. 16), adopts the name *Liomyza flavipes*, instead of *scatophagina*, *Agromyza flavipes*, Fall., and *Heteroneura scatophagina*, Fall., being of the same date.

WEYENBURGH, Tijdschr. Ent. (2) t. v. pp. 196-200, Taf. 7, gives a full life-history of *Phytomyza* (*Napomyza*) *harlemensis*, n. sp., and also refers to all the other species of the subgenus *Napomyza*.

Phytomyza (*Napomyza*) *harlemensis*, sp. n., Pet. Nouv. Oct. 1, 1869; and Tijds. Ent. (2) v. p. 196, T. 7, Holland.

Phytomyza melanogaster, sp. n., Thoms. Eugen. Resa, p. 610 (1868), Patagonia.

Agromyza metallica, Mauritius; *pictella*, *platyptera*, California; *tristella*, China: spp. nn., Thoms. l. c. pp. 608, 609.

Ortalinae, Loew.

Ortalis dispila, Rossi I.; *distans*, *spathulata*, *punctifrons*, Puna; *obliqua*, Callao; *platystoma*, Panama: spp. nn., Thoms. l. c. pp. 572-574.

Herma [= *Herina*, R.-Desv.] *connata*, Sydney; *fusca*, Manilla; *lineatocollis*, Cape of Good Hope: spp. nn., Thoms. l. c. pp. 575, 576.

Senopterina abrupta, Manilla; *rugifrons*, Sydney: spp. nn., Thoms. l. c. pp. 577, 578.

Richardia angulata, sp. n., Thoms. l. c. p. 576, Taiti.

Platystoma suavis, sp. n., Lw. Nachr. Ges. Mosc. no. 30, Turkestan.

Platystoma irrorata, sp. n., Thoms. l. c. p. 577, Malacca.

Ulidia melampodia, sp. n., Lw. l. c. no. 31, Turkestan.

Empylocera abstersa, sp. n., Lw. l. c. no. 32, Turkestan.

Sapromyzinae.

LOEW, JB. gel. Ges. Krak. xli. (p. 15) believes *Sapromyza decipiens*, Lw., *S. lata*, Zett., and *Lauzania sordida*, Hal., to be all distinct species.

Lauzania crinicornis, Mauritius; *curvinervis*, China; *latifrons*, Manilla; *melanogaster*, Sydney; *nigropunctata*, Guam; *nasalis*, *planiscuta*, *quadrisetosa*, California: spp. nn., Thoms. Eug. Resa (1868), pp. 567-569.

Sapromyza angustifrons, Mauritius; *carinata*, Sydney; *connexa*, Brazil; *setosa*, Valparaíso: spp. nn., Thoms. l. c. pp. 564, 565.

Trypetinae.

RONDANI, Bull. Soc. Ital. ii. pp. 5-31, makes several changes in synonymy in this family: in *Myopites* he makes *limbardæ*, Schin., = *stylata*, F.; *maculata* and *mentharum*, R.-Desv., *longirostris*, Lw., and *frauenfeldi*, Schiner, = *blotii*, Bréb.; while *inulæ*, v. Roser, is distinct from *stylata*, F.: in *Urophora*, *eriolepidis*, Lw., *brunnicornis*, R.-Desv., and *aprica*, Mg., = *centaureæ*, R.-Desv.; *dejeanii*, R.-Desv., = *aprica*, Fall.; *stigma*, Lw., = *unimaculata*, v. Roser; *solstitialis*, R.-Desv., = *stylata*, F.; *sonchi*, R.-Desv., = *quadrifasciata*, Mg.: in *Carpomyia*, *schineri*, Lw., and *bucchichi*, Frfld., = *vesuviana*, Costa, and he prefers the name *signata*, Mg., to *cerasi*, L.; he also defends the genus *Carpomyia* for these two species: in *Petalophora* (= *Ceratitis*, M'Leay) he distinguishes *capitata*, W., from *hispanica*, Brémé: in *Stemonocera* (n. gen., vide *infra*) he makes *abrotani*, Mg., = *cornuta*, Scop., and therefore excludes *cornuta*, Scop., from the synonyms of *Ceriocera* (olim *Cerajocera*) *cornuta*, Fabr.: in *Tripeta*, *acuticornis*, Lw., = *longicornis*, Mg.; *onotrophes*, Lw., *solstitialis*, Pz. (nec alior.), *dorsalis*, Mcq. nec Desv., *arctii*, Fall. pt. Zett. nec Mg., Mcq., = *cyllindrica*, R.-Desv., of which he also suspects *lucida*, Lw., to be a variety; *ruficauda*, F., and *punctata*, Fall. (1814), = *florescentia*, L.; he considers *succinea*, Costa (= *falcata*, pt. Lw., Schin.), *falcata*, Scop. (= *octopunctata*, Mcq., and *flavescens*, R.-Desv.), and *punctata*, Schrk. (= *intermedia*, Frfld., and *falcata*, pt. Lw., Schin.), to be distinct species; *tussilaginis*, F., *acanthi*, Schrk., and *vicina*, Mcq., = *arctii*, Deg.; and he thinks *dentata*, Lw., a variety of *serratulæ*, L.: in *Oxyna*, *elongatula*, Lw., = *absinthii*, F.; *absinthii*, Lw., he renames *dracunculi*; *producta* and *tessellata*, Lw.?, = *punctella*, Fall.; *obesa*, Lw., = *femoralis*, R.-Desv.; *proboscidea*, Lw.?, = *cinerea*, R.-Desv., which is distinct from *pantherina*, Fall., = *parietina*, L. At the commencement of this paper (pp. 5-10) is an analytical table of all the Italian genera of *Trypetinae*.

WEYENBURGH, Tijd. Ent. (2) v. pp. 190-195, pl. 7, gives a full life-history of *Trypeta serratulæ*, L. (= *pallens*, Mg., *palpata* and *luteola*, R.-Desv., but not *serratulæ*, Fab., which = *acuticornis*, Lw.).

LOEW, B. E. Z. xiv. pp. 143, 144, redescribes *Carpotricha guttulosa* and *Tephritis pæcilura*.

FRAUENFELD, Verh. z.-b. Wien, xx. p. 660, mentions *Trypeta eluta*, from Trieste, and, p. 663, *congrua* and *eriolepidis*, from Alplsteig.

Stemonocera, gen. nov., Rond. Bull. Soc. Ital. ii. p. 30. Allied to *Spilographa*. *S. cornuta*, Scop. (nec Fall.), = *abrotani*, Mg.

Campiglossa, gen. nov., Rond. l. c. p. 121, a subgenus of *Oxya*. *C. irrorata*, Fall., and *grandinata*, sp. n., l. c. pp. 123, 131, Apennines and Piedmont.

In the analytical table Rondani, l. c. p. 9, includes two other new genera, viz.:—*Phagocarpus*, g. n., type *permundus*, Harris [= *antica*, W., = *gædii*, Mg.]; and *Philophylla*, g. n., type *cæsius*, Harris [generally considered to be *heraclei*, L.].

Oxya corticina, Apennines; *cribrina*, Parma; *guttella*, Parma: spp. nn., Rond. l. c. pp. 122–128.

Urophora jaculata, Parma and S. Italy; *lejura* (= *macrura*, Lw. ?, = *cuspidata*, Mg. ?), Parma and Sardinia; *scutellata*; *sibynata*, Parma and Piedmont; *venabatula* (= *cardui*, R.-Desv.), Italy; *veruata*, Parma; *vulcanica*, near Vesuvius: spp. nn., Rond. l. c. pp. 13–18.

Tripeta cynaræ, *loricata*, *vittata*, *syllibi*, Parma; *nebrodesia*, Sicily; *steropea*, S. Italy: spp. nn. Rond. l. c. pp. 107–118.

Trypeta [sensu latissimo] *acutangula*, *aurifera*, *genalis*, *femoralis*, *liogaster*, California; *biocellata*, *meteorica*, *plagiata*, Buenos Ayres; *chrysura*, Rio Janeiro; *crassipes*, Honolulu; *glauca*, *undecimguttata*, *heterura*, Sydney; *longirostris*, Foua; *sexincisa*, *sinensis*, China: spp. nn., Thoms. Eugen. Resa, pp. 579–586.

Sepsinæ.

LOEW, JB. gel. Ges. Krak. xli. (p. 15), revives Schrank's name *sphondylii* for *Saltella scutellaris*, Fall.

Sepsis albicoxa, Brazil; *ecalcarata*, California; *igniventris*, Mauritius; *monostigma*, *viduata*, China: spp. nn., Thoms. l. c. pp. 586–588.

Prophila concolor, sp. n., Thoms. l. c. p. 596, California.

Tanypezinæ.

LOEW, B. E. Z. xiv. pp. 209–212, revises the European species of *Calobata*, and gives an analytical table of those known to him: he remarks that *solidaginis* and *soror*, R.-Desv., and *nigricornis*, Zett., = *cibaria*, L.; also *inula*, R.-Desv., = *ephippium*, F.

Calobata adusta, *longiceps*, Germany; *latifrons*, *nitens*, *stylifera*, Kultuk: spp. nn., Loew, l. c. p. 212.

Calobata longiventris, Ascension; *macropus*, Rossi I.: spp. nn., Thoms. Eugen. Res. p. 589.

Nerius longicoxa, sp. n., Thoms. l. c. p. 590, Ascension.

Psilinæ.

LOEW, JB. gel. Ges. Krak. (p. 15), says *Psila dispar*, Schum., = *Psilomyia audouini*, Zett.

Chloropinæ.

Chlorops fuscipennis, Rossi I.; *glabricollis*, Buenos Ayres; *longicornis*, China; *vittipennis*, Manila: spp. nn., Thoms. l. c. pp. 603, 604.

Eurhina albovariegata, sp. n., Thoms. l. c. p. 606, Malacca.

Oscinis ensifera, *insignis*, China; *pruinosa*, *selachopina*, Sydney: spp. nn., Thoms. l. c. pp. 605, 606.

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Hippelates flavus, Keeling I.; *genalis*, California; *nigricornis*, Rossi I.: spp. nn., Thoms. l. c. pp. 607, 608.

Ephydrinæ.

LOEW repeats, JB. gel. Ges. Krak. xli. (p. 14), that the two genera *Psilopa* and *Psilopus* can coexist, and therefore Schiner's genus *Ephygrobia* sinks to *Psilopa*, Fall.

LOEW, l. c. p. 14, objects to Latreille's genus *Mosillus* being revived for *Gymnopa*, Meig., contending that, as Latreille's genus had remained unrecognized for 60 years, that alone proved insufficient description. The genus has recently been recognized from the peculiar habit of the species mentioned by Latreille. Loew, however, admits that he would adopt *Mosillus* if he could find any meaning in the word! He adds that the genus cannot belong to the *Oscinidæ*, but is probably one of the *Ephydrinæ*.

Ephydra hispidosa, Rio Janeiro; *ochropus*, Montevideo; *pentastigma*, California; *pleuralis*, Manilla; *prionoptera*, Patagonia: spp. nn., Thoms. Eugen. Resa, pp. 590-593.

Notiphila granifera, Rossi I.; *quadrisetosa*, California; *radiatula*, China: *sternalis*, Manilla: spp. nn., Thoms. l. c. pp. 593-595.

Mosillus opaculus, sp. n., Thoms. l. c. p. 595, Foua.

Drosophilinæ.

Drosophila apicata, California; *gigantea*, Buenos Ayres; *sphærocera*, Patagonia: spp. nn., Thoms. l. c. pp. 596, 597.

Geomyzinæ.

LOEW contends, JB. gel. Ges. Krak. xli. (p. 13), that there is not sufficient objection to the two names *Anthomyza*, Fall., and *Anthomyia*, Meig., coexisting: therefore *Leptomyza*, Macq., and *Anthophilina*, Zett., sink to *Anthomyza*.

Geomyza laticosta, Malacca; *pictipennis*, Cape of Good Hope; *spuria*, China: spp. nn., Thoms. l. c. pp. 598, 599.

Tetanocerinæ.

Tetanocera bisetosa, Montevideo; *patagonica*, Patagonia; *vittipennis*, Cape of Good Hope: spp. nn., Thoms. l. c. pp. 570, 571.

Sciomyzinæ.

Sciomyza propinqua, *reticulata*: spp. nn., Thoms. l. c. p. 570, China.

Dryomyzinæ.

HENSEL, B. E. Z. xiv. pp. 133-135, proves that *Dryomyza zawadskii*, Schummel, is only a winter form of *D. flaveola*, F.

Helomyzinæ.

Helomyza limbata, sp. n., Thoms. l. c. p. 569, California.

Scatophaginae.

Scatophaga helenæ, St. Helena; *thinobia*, California: spp. nn., Thoms. *l. c.* pp. 562, 563.

Phycodrominae.

Orygma antarctica, *trichosterna*, Patagonia: spp. nn., Thoms. *l. c.* pp. 601, 602.

Borborinae.

Limosina angulata, Brazil; *melanogaster*, Buenos Ayres: spp. nn., Thoms. *l. c.* pp. 602, 603.

HIPPOBOSCIDÆ.

Olfersia ænescens, Keeling I.; *sulcifrons*, Panama: spp. nn., Thoms. *l. c.* pp. 610, 611.

Ornithomyia gemina, sp. n., Thoms. *l. c.* p. 611, Callao.

APHANIPTERA:

RITSEMA, Tijdschr. Ent. (2) v. pp. 185, 186, makes a few remarks on Westwood's new order *Achreioptera*, and on the species *Platypsyllus castoris*. He defends his own priority of the description in Pet. Nouv. Sept. 15, 1869, and considers the insect only sufficiently distinct from the *Pulicidæ* to form a family *Platypsyllidæ*, of equal value to *Pulicidæ*, both belonging to the sub-order *Suctoria* = *Aphaniptera*.

BOLD, Tr. North. Durh. iii. pt. 3, p. 378, mentions *Pulex talpæ*, from a field-mouse at Cheviot.

GUYON, C. R. lxx. pp. 785-792, publishes a note accompanying the presentation of the work called "Histoire Naturelle et Médicale de la Chique, *Rhynchoprion penetrans*, Oken," in which he mentions how the French Expedition to Mexico was troubled by this pest.

ROULIN, C. R. lxx. pp. 792-796, publishes an additional note on the same insect, mentioning a parallel case in which a military expedition was troubled in South America.

NEUROPTERA

By R. M'LACHLAN, F.L.S., Sec. Ent. Soc.

BECK, J. On a mode of ascertaining the structure of the scales of the *Thysanuradæ*. M. J. Micr. Soc. iv. pp. 252, 253.

EATON, A. E. On some British species of *Ephemeridæ*. Tr. E. Soc. 1870, pp. 1-8.

——. (See also M'LACHLAN, R.)

LUBBOCK, J. Notes on the *Thysanura*. Part IV. Tr. L. S. xxvii. pp. 277-297, tab. 45 & 46.

M'INTIRE, S. J. The structure of the scales of certain Insects of the order *Thysanura*. M. J. Micr. Soc. iii. pp. 1-5, pl. xxxvii.

M'LACHLAN, R. A catalogue of British *Neuroptera* (the *Ephemeri* by A. E. EATON). Part of a proposed General Catalogue of the Insects of the British Isles; published by the Entomological Society of London.

———. Descriptions of a new genus and four new species of *Calopterygidae*, and of a new genus and species of *Gomphidae*. Tr. E. Soc. 1870, pp. 165–172.

———. New species &c. of *Hemerobiina*. Second series (*Osmylidae*). Ent. M. M. vi. pp. 195–201.

———. On the occurrence of the Neuropterous genus *Sialis* in Chili. Ent. M. M. vii. pp. 145, 146.

———. Notes additionnelles sur les Phryganides décrites par M. le Dr. Rambur. Ann. E. Belg. xiii. pp. 1–12.

PACKARD, A. S. Jr. New or rare American *Neuroptera*, *Thysanura*, and *Myriopoda*. P. Bost. Soc. xiii. pp. 405–409.

———. Certain parasitic Insects. Am. Nat. 1870, pp. 83–99, pl. i.

A semipopular paper on “lice,” referring partly to *Anoplura* and partly to *Mallophaga*, and describing and figuring new species of the latter.

RITSEMA, C. De *Enoicyla pusilla*, Burm., in hare verschillende toestanden. Tijdschr. Ent. 1870, pp. 111–120, pl. 5.

RUDOW, F. Beobachtungen über die Lebensweise und den Bau der Mallophagen oder Pelzfresser, sowie Beschreibung neuer Arten. Z. ges. Naturw. 1870, i. pp. 272–302.

SELYS-LONGCHAMPS, E. DE. Résumé d'une nouvelle Classification des Cordulines. Ann. E. Belg., comp. rend. 5 Nov. 1870.

The “Comptes-Rendus” of the meetings of the Society are distributed monthly to the members.

WALLENGREN, H. D. J. Anteckningar i Entomologi. Cefv. Sv. Ak. 1870, pp. 145–171.

These notes refer principally to *Neuroptera*; but there are also lists of additions to the Swedish Fauna in *Diptera*, *Hemiptera*, and *Orthoptera*.

M'LACHLAN, in the ‘Catalogue of British *Neuroptera*,’ enumerates 323 species as inhabiting the British Isles, and gives the complete synonymy known to him at the time of compilation. 137 species belong to the *Pseudo-Neuroptera*, 50 to the *Planipennia*, and 136 to the *Trichoptera*, into which three great divisions the Linnean order *Neuroptera* is divided. The *Ephemeri* are entirely compiled by EATON, the other families by the Recorder.

Reviewed by Stein in B. E. Z. 1870, pp. 427, 428, and by Zeller in S. E. Z. 1870, pp. 425, 426.

M'LACHLAN (Tr. E. S. 1870, p. 531) notices a few insects of this order collected at Kinsebo (Congo) by Ansell.

WALLENGREN (Öfv. Sv. Ak. 1870, pp. 145-182) enumerates and describes species new to the Swedish fauna.

TRICHOPTERA.

WALLENGREN (Öfv. Sv. Ak. 1870, pp. 157-171) describes 32 known species as new to the Swedish fauna. He has also (*l. c.* pp. 146-151) given a revision of Zetterstedt's species of the *Æquipalpia*, after an examination of the types. *Phryganea nubila* = *Rhyacophila vulgaris*, Pict.; *P. charpentieri* = *Philopotamus montanus*, Don.; *P. umbrosa* = *Polycentropus flavomaculatus*, Pict.; *P. waenerii* and *P. griseola* = *Tinodes lurida*, C.; *P. aureola* = *Tinodes pusilla*, C., M'L.; *P. hirta* = *Mormonia hirta*, F.; *P. ciliaris* = *Notidobia ciliaris*, L.; *P. chrysocephala* = *Sericostoma spencii*, Kby. ?; *P. minuta* = *Silo pallipes*, F.; *P. tincta* = *Brachycentrus subnubilus*, C.; *P. vestita* and *albicans* = *Molanna angustata*, C.; *P. barbata* = *Leptocerus nervosus*, F.; *P. hectica* = *Setodes ochracea*, C.; *P. ochrata* = *Trienodes bicolor*, C.; *P. 4-fasciata* = *Mystacidodes 4-fasciata*, F. (= *longicornis*, L.); *P. albifrons* = *Leptocerus albifrons*, L.; *P. azurea* = *Mystacidodes azurea*, L. (= *nigra*, Pict.); *P. nigra* = ?

M'LACHLAN (Ann. E. Belg. xiii. pp. 1-12) revises many of Rambur's species, after an examination of the types. The *Inæquipalpia* had already been revised by Hagen; and M'Lachlan mostly agrees with his views, excepting that he states *Limnephila scabripennis* to be a *Stenophylax*, and not an *Halesus*. In the *Æquipalpia* he gives the following determinations:—*Mystacidodes venosa* = *Leptocerus nervosus*, F.; *M. albimacula* = *Leptocerus bimaculatus*, St.; *M. obsoleta* = *Setodes ochracea*, C.; *M. rufina* = *Leptocerus cinereus*, C.; *M. leucophaea* and *subtrifasciata* = *Setodes leucophaea*, R.; *M. vetula* = *Leptocerus dissimilis*, St.

WHITE (Ent. M. M. vii. p. 53) records *Limnophilus pavidus*, Hag., and *Phryganea obsoleta*, Hag., from Inverness-shire, Scotland.

Brachycentrus subnubilus. M'Lachlan (Ent. M. M. vii. p. 19) records a partially gynandromorphous individual of this species; the palpi and left anterior wing are female, but all the rest of the insect has male characters. (See also Tr. E. S. 1870, Proc. p. xxiii.)

Enicocla pusilla. Ritsema (Tijdschr. Ent. 1870, pp. 111-120) gives a history of the metamorphoses of this terrestrial species, accompanied by a plate of figures of the different stages.

NEUROPTERA PLANIPENNIA.

Sialidæ.

Sialis fuliginosa. Wallengren (Öfv. Sv. Ak. 1870, p. 152) records the occurrence of this species in Sweden.

A species of *Sialis* is noticed by M'Lachlan (Ent. M. M. vii. p. 146) as occurring in Japan.

Sialis chilensis, n. sp., M'Lachlan, Ent. M. M. vii. p. 145, Chili.

Mantispidæ.

Mantispa styriaca. A translated abstract of Brauer's account of the meta-

morphoses (Zool. Rec. 1869, p. 449) is given by Giraud in Ann. Soc. Ent. Fr. 1870, Bull. p. xxxi; and by M'Lachlan in Ent. M. M. vii. pp. 77-79.

Osmyliidæ.

M'LACHLAN, Ent. M. M. vi. p. 195, tabulates the genera allied to *Osmylus*, and enumerates the species belonging to each genus; he remarks that in many species the tarsal claws are bifid or serrate. He places *Chrysopa pubicosta*, Walker, provisionally in *Osmylus*, and redescribes it, *l. c.* p. 198.

Hyposmylus, n. g., M'Lachlan, Ent. M. M. vi. p. 200. Allied to *Osmylus*, but the costal veinlets transversely united, so as to form many rows of costal cellules. Type *H. punctipennis*, Walker (described).

Osmylus multiguttatus, p. 195, Trebizond; *lineatocollis*, p. 196, India; *langii*, p. 197, India; *interlineatus*, p. 199, Natal (or India?); *inguinatus*, p. 200, Ceram: spp. nn., M'Lachlan, *l. c.*

Hemerobiidæ.

WALLENGREN (Efv. Sv. Ak. 1870, pp. 154-157) records the addition of six species to the Swedish fauna, one of which, *Hemerobius orotypus* (*l. c.* p. 155), is new.

Psectra diptera. Packard (Proc. Bost. Soc. xiii. p. 407) states that a specimen of this rare insect had occurred in Maine, and does not differ, according to Hagen, from European individuals.

Chrysopidæ.

WALLENGREN (Efv. Sv. Ak. 1870, p. 153) records the addition of 3 known species to the Swedish fauna.

Coniopterygide.

M'LACHLAN (Ent. M. M. vi. p. 238) remarks on the sexes of *Coniopteryx*, and is opposed to the supposition that *psociformis* and *aleyrodiformis* may be only sexes of one species.

Panorpidae.

Merope tuber. Selys-Longchamps (Ann. E. Belg. xiii. Comp. rend. p. xxx) states that he has received a pair of this extremely rare species, and remarks on the structure of the anal appendices of the male.

Panorpa cognata. Wallengren (Efv. Sv. Ak. 1870, p. 152) records the occurrence of this species in Sweden.

Boreus californicus, sp. n., Packard, Proc. Bost. Soc. xiii. p. 408, California, on the snow on Dec. 11th.

PSEUDO-NEUROPTERA.

THYSANURA*.

LUBBOCK (Tr. L. S. xxvii.) continues his series of papers on the British species of *Thysanura*, describing several known species and some new ones,

* The Recorder renews his protest (Zool. Rec. 1869, p. 451) against this family and the *Mallophaga* coming within his province.

which are noticed below. The greater part of this paper is occupied by an elaborate outline of the anatomy and classification of the creatures, and details on experiments undertaken with a view of testing Bourlet's statements as to the reproduction of lost parts. His experiments were chiefly made upon the antennæ; and he arrives at the conclusion that, although injuries to these organs are repaired, still a mutilated antenna never regains the proper number of joints, though the others become increased in length. With regard to the respiratory system, he adheres to his original statement that there are only two spiracles in *Smythurus*, and that these are situated on the head, in opposition to the statement of Nicolet, who professed to have observed a series of abdominal spiracles, and to that of Von Olfers, who could find only one pair, and these thoracic. The muscular system is minutely detailed and explained by beautifully executed illustrations on the two plates. His remarks on the classification of *Thysanura* are of great value. After reviewing the position assigned to them by various writers, and considering their external and internal anatomy, and the absence of metamorphoses, he arrives at the conclusion that, although more nearly allied to the *Insecta* than to the *Crustacea* or *Arachnida*, he cannot regard them as *Orthoptera* or *Neuroptera*, or even as true insects. The Recorder, without venturing to approve this opinion in its fullest significance, commends it to the notice of those entomologists who, by including them in *Neuroptera* or *Orthoptera*, help to maintain an already existing chaos of discordant forms.

M'INTIRE, M. J. *Micr. Soc.* iii. pp. 1-5, pl. xxxvii., enters into a minute microscopical examination of the scales of various species, and gives magnified drawings in illustration of his subject. He arrives at the conclusion that the scales are regularly corrugated as in *Lepidoptera*, and that there is no bead-like structure between the membranes, as has been suggested.

BECK, *l. c.* iv. pp. 252, 253, follows upon the same subject, and asserts that the two surfaces are dissimilar, the upper being nearly flat, while the under is furnished with longitudinal ribs.

Beckia, g. n., Lubbock, *l. c.* p. 279. Intermediate between *Lepidocyrtus* and *Degeeria*. Body scaly; antennæ 4-jointed; thorax not projecting over head; abdominal segments unequal. Type *B. argentea*, sp. n., England.

Seira, g. n., Lubbock, *l. c.* Body scaly; antennæ 4-jointed, terminal segment not ringed; eyes on a dark patch; thorax not projecting over the head; abdominal segments unequal. In this are included *Degeeria domestica*, Nicolet, and a new species.

Isotoma grisea, sp. n., Lubbock, *l. c.* p. 278, England.

Seira buskii, sp. n., Lubbock, *l. c.* p. 280, England.

Campodea americana, sp. n., Packard, *P. Bost. Soc.* xiii. p. 409, Massachusetts.

MALLOPHAGA.

PACKARD (*Am. Nat.* 1870, pp. 83-99) gives a well-written semipopular account of the habits of lice (including *Anoplura*) with woodcuts, and a plate of well-executed figures. He also describes and figures several new species, noticed below.

RUDOW (*Zeits. gesamm. Naturw.* 1870, i. pp. 272-302) continues his researches upon these parasites. The greater part of his paper is devoted to an account of the bibliography, anatomy, and modes of life. Although chiefly

infesting birds, it is known that some few species also inhabit the fur of mammalia; but none have been observed upon the *Chiroptera*.

Docophorus buteonis, p. 93, pl. i. fig. 3, on "the red-shouldered hawk;" *D. hamatus*, p. 94, pl. i. fig. 7, on *Plectrophanes nivalis*; *Nirmus thoracicus*, pl. i. fig. 5, on the snow-bunting; *Goniocetes burnettii*, fig. 26 ("27" in error in text), on the common fowl; *Lipeurus corvi*, p. 95, pl. i. fig. 2, on the crow; *L. elongatus*, pl. i. fig. 4, on ?; *L. gracilis*, pl. i. fig. 6, on ?; *Colpocephalum lari*, p. 96, pl. i. fig. 1, on *Larus marinus*: spp. nn., Packard, l. c.

TERMITIDÆ.

NICHOLSON, Manual of Zoology, i. pp. 219-221, gives a short account of the conditions and habits of these insects, after Bates's observations.

Termes flavipes. Sanborn, Am. Ent. ii. pp. 266-268, has a popular article on the habits of this species, illustrated by excellent woodcuts of the various stages and conditions. Shimer, l. c. p. 324, notices the destruction occasioned by it to books and public documents.

PSOCIDÆ.

Amphientomum hageni, sp. n., Packard, P. Bost. Soc. xiii. p. 405, with woodcut, Maine and Massachusetts. An extremely interesting discovery, the genus having only hitherto been noticed in a living state in Ceylon, and found also enclosed in Zanzibar gum-copal, and fossil in amber.

SHIMER, Am. Ent. ii. p. 324, notices the damage occasioned to books by insects of this family. He evidently refers to *Atropos* or *Clothilla*, and seems to regard these apterous forms as larvæ of winged species. The Recorder believes he is mistaken in this supposition.

PERLIDÆ.

Perla bicaudata, L., and *P. maxima*, Scopoli. M'Lachlan, Ent. M. M. vi. p. 265, discusses the question as to what species are represented by these two names. He considers it not possible to settle the identity of *bicaudata*, L., but refers *bipunctata*, Pictet, to *maxima*.

EPHEMERIDÆ.

EATON, Tr. E. S. 1870, p. 1, asserts that *Ephemerella danica* of Pictet is not the same as the like-named species of Müller. He redescribes the former as *E. lineata*, Eaton, and states that he has found it on the Thames at Reading. He also describes the imago of *Baetis phæopa*, Steph., l. c. p. 4, and of *B. niger*, L., l. c. p. 6. Furthermore, according to him, *Baetis montana*, Hagen, is not Pictet's species; and he describes the former as *Heptagenia insignis*, l. c. p. 7.

New species.

Cloeon simile, Eaton, Tr. E. S. 1870, p. 2, England.

Centroptilum pennulatum, Eaton, l. c., England.

Baetis scambus, Eaton, l. c. p. 3, England; *atrebatinus*, l. c. p. 4, England; *tenax*, l. c. p. 5, England; *bucératus*, l. c., England.

Siphonurus armatus, Eaton, l. c. p. 6, England and Ireland; *lacustris*, l. c. p. 7, Wales.

Heptagenia volitans, Eaton, l. c., England.

ODONATA.

Corduliidæ.

De SELYS-LONGCHAMPS (Compt.-rend. Soc. Ent. Belg. 5 Nov. 1870) gives an outline of the arrangement of these insects adopted by him in his forthcoming "Synopsis des Cordulines." He divides them into two "Legions," *Cordulia* and *Epophthalmia*. *Cordulia* comprises three "genera," *Cordulia*, *Epitheca*, and *Cordulephya*. The genus *Cordulia*, again, is separated into two "subgenera," *Hemicordulia*, Selys, and *Cordulia*, Leach (restricted): *Epitheca* comprises three "subgenera," *Epitheca*, Charp., *Oxygastra*, Selys, and *Gomphomacromia*, Brauer. *Epophthalmia* is divided into four "genera," *Idionyx*, *Synthemis*, *Epophthalmia*, and *Æschnosoma*. *Epophthalmia* is again divided into two "subgenera," *Epophthalmia* and *Macromia*. The terms *Hemicordulia*, *Oxygastra*, *Cordulephya*, and *Æschnosoma* represent new divisions or, as the Recorder prefers to term them, genera. Some new species are indicated, but not described.

Cordulia metallica. M'Lachlan (Ent. M. M. vii. p. 38) records this species as occurring in Inverness-shire, Scotland.

Gomphidæ.

Hypopetalia, g. n., M'Lachlan, Tr. E. S. 1870, p. 170. Differs from *Petalia* and *Phyllopetalia* in having three cellules in the discoidal triangles of all the wings, and five cellules in the anal triangle of posterior wings. Type *H. pestilens*, sp. n., M'Lachlan, l. c. p. 171, Chili.

Calopterygidæ.

Psolodermus, g. n., M'Lachlan, Tr. E. S. 1870, p. 165. Pterostigma large in all the wings in the male; basal space empty; arculus angulate; inferior branch of second sector running obliquely into the inner margin; all the sectors much ramified and curved. Type *P. mandarinus*, sp. n., l. c. p. 166, Amoy.

Euphæa compar, sp. n., M'Lachlan, l. c. p. 167, Amoy.

Micromeris bisignatus, sp. n., M'Lachlan, l. c. p. 168, Celebes.

Chalcopteryx scintillans, sp. n., M'Lachlan, l. c. p. 169, St. Paulo, Amazons.

ORTHOPTERA

By R. M'LACHLAN, F.L.S., Sec. Ent. Soc.

ANDREOZZI, ALFONSO. Sulla cavallette; considerazioni estratto dal "Nun'-cen'-ziuen-sciu," ossia 'Trattato completo sull' Agricoltura,' e tradotte letteralmente del Cinese, pp. 1-56. The Recorder has not seen this work. (See STEFANELLI.)

BROWN, EDWIN. Remarks on the recent migration to Britain of

- Acridium peregrinum*, a Locust new to the European Fauna. Ent. M. M. vii. pp. 1-3.
- BULLER, WALTER. Notes on the genus *Deinacrida* in New Zealand. Zool. s. s. pp. 849-851.
- GHILLIANI, V. Sulla *Opomala sicula*. Bull. Ent. Ital. 1870, pp. 138, 139.
- GRABER, V. Faunistische Studien in der syrmischen Bucht. I. Ueber Orthopteren. Verh. z.-b. Wien, 1870, pp. 367-380.
- . Die Ähnlichkeit im Baue der äusseren weiblichen Geschlechts-organe bei den Locustiden und Akridiern, dargestellt auf Grund ihrer Entwicklungsgeschichte. SB. Ak. Wien, 1870, pp. 597-616.
- HORVÁTH, G. v. Ueber die in v. Frivaldszky's 'Monographia Orthopterorum Hungariæ' beschriebenen neuen Arten. B. E. Z. 1870, pp. 41-46.
- MEINERT, F. En for den danska fauna ny *Forficula*. Nat. Tids. (3) Bd. v. pp. 276, 277.
- . Om dobbelte sædgange hos Insekter; fortstalle til Forficulernes anatomi. Nat. Tids. (3) Bd. v. pp. 278-294, tab. xii., xiii.
- SAUSSURE, H. DE. Additions au Système des Mantides. Mitth. schw. ent. Ges. iii. pp. 222-244.
- . Mélanges Orthoptérologiques. 3^e fascicule. Mantides. Mém. Soc. Phys. Genève. xxi. pp. 1-214.
- The volume of "Mémoires" in which this appears was published in 1871; but the whole series of "Mélanges" is also brought out separately in parts; and the present appeared in 1870, and is paged 149-358.
- STEFANELLI, P. Il disastro delle Cavallette nella China. Bull. Ent. Ital. 1870, pp. 77-82.
- An extended notice of Andreozzi's translated Chinese work (*vide supra*).
- THOMAS, CYRUS. Descriptions of Grasshoppers from Colorado. P. Ac. Philad. 1870, pp. 74-84.
- WALKER, F. List of the *Dermaptera* discovered by J. K. Lord, Esq., in Egypt and the adjoining countries; with descriptions of the new species. Zool. s. s. 1870, pp. 2296-2303.
- . Catalogue of the Specimens of *Blattariæ* in the Collection of the British Museum. 8vo, pp. 1-239. Published by order of the Trustees.

WALKER, F. Supplement to a Catalogue of the *Blattariæ*. Forms pp. 119–153 of pt. i. of the next-noticed Catalogue.

———. Catalogue of the Specimens of *Dermaptera saltatoria* in the Collection of the British Museum. 8vo. Part i. pp. 1–117, 154–224; pt. ii. pp. 225–423; pt. iii. pp. 425–604. Published by order of the Trustees.

WALKER has compiled four volumes of the so-called Catalogues of the *Orthoptera* of the British Museum—the “*Blattariæ*” (bearing 1868 on its titlepage, with supplement thereto), “*Gryllidæ*,” “*Locustidæ*,” and a portion of the “*Acrydiidæ*.” Many “new genera” and multitudes of “new species” are described therein. The Recorder has simply enumerated these. Like all the other “Catalogues” by this author, these bear the same intensely mechanical stamp, and there is shown no evidence that he has comprehended the affinities of the insects he enumerates or describes, or that he conscientiously appreciates the probable results of his labours. It may be confidently expected that the justice of these remarks will be borne out by the verdict of orthopterists. So far as the *Blattariæ* are concerned, Brunner van Wattenwyl, the highest authority on the family, has already approved them by anticipation. As a compiler the author has probably no equal; he should limit himself to compiling, and not plunge the knowledge of any family he undertakes into utter chaos by describing new genera and species. The few critical remarks here and there given are generally worthless, often absolutely unintelligible, e. g. *Blatta picticollis* (Suppl. Blatt. p. 141):—“This species appears to consist of the genera *Blatta* and *Epilampra*,” leading one to infer that, to counterbalance his often-proved mistakes in having (in other orders) separated one *species* into many *genera*, he has, in this instance, knowingly grouped insects of different genera under the same species.

WALLENGREN, Cefv. Sv. Ak. 1871, p. 182, records the addition of four described species to the Swedish fauna.

GRABER, Verh. z.-b. Wien, 1871, pp. 367–380, enumerates 56 species observed by him in Syrmia, a marshy district on the north bank of the Danube. Of these, 2 are *Forficulariæ*, 4 *Blattidæ*, 1 *Mantidæ*, 6 *Gryllidæ*, 17 *Locustidæ*, and 24 *Acrydiidæ*. He accounts for the paucity of the list by the fact that the district is frequently inundated, and abounds in frogs and fen-frequenting birds.

FORFICULARIÆ.

Labidura advena, sp. n., Meinert, Nat. Tids. (3) v. p. 279, Jamaica.

BLATTIDÆ.

BRUNNER VAN WATTENWYL (Verh. z.-b. Wien, 1870, pp. 161–166), in the form of a letter to Dr. Gray, passes severe strictures on the Catalogues published by the British Museum, with especial reference to Walker’s ‘Catalogue of *Blattariæ*.’ An abstracted translation of his remarks appears in the R. Z. 1870, pp.

Blatta maderæ. BOLD (Tr. North. Durh. iii. p. 377) notes the occurrence of multitudes of these insects in the interior of a sofa that had been brought from the East Indies.

WALKER (Cat. *Blattariæ*) describes the following as new genera and new

species:—**BLABERIDÆ**: *Blabera quadrifera* (p. 3), Mexico; *subspurecata* (p. 4), St. Domingo and Brazil; *decisa* (p. 5), locality unknown; *laticollis*, British Guiana; *nigripennis* (p. 6), Brazil; *fusiformis* (p. 7), locality unknown; *parabolica* (p. 8), Cuenca; *longipennis*, Guyaquil. *Libisoca* (gen. nov.) *æqualis* (p. 12), St. Domingo.—**POLYPHAGIDÆ**: *Polyphaga indica* (p. 14), India; *sinensis*, North China; *cryptospila* (p. 15), East Africa; *silphoides* (p. 182), Cambodia. *Tarraga* (gen. nov.) *guttiventris* (p. 16), Rio Janeiro. *Sisapona* (gen. nov.) *marginalis* (pp. 16, 17), Honduras. *Laxta* (gen. nov.) *onisoides* (pp. 17, 18), Australia; *chitonoides*, locality unknown. *Ergaula* (gen. nov.) *scarabæoides* (p. 19), Philippines.—**PANESTHIDÆ**: *Panesthia regalis* (p. 21), Silhet and Assam; *quadrinaculata*, Philippines, Java, Borneo; *passaloides* (p. 22), Ceylon; *necrophoroides*, Tenasserim; *rufa* (p. 23), Ceylon; *conica*, Java; *lata* (p. 24), locality unknown.—**PANCHLORIDÆ**: *Panchlora celebessa* (p. 26), Celebes; *nigricornis* (p. 28), Quito; *contusa* (p. 30), Cape; *tenebrigera* (p. 31), India; *lata*, Gambia; *scutelligera* (p. 32), Gambia; *inæqualis* (p. 33), locality unknown; *laticosta*, Angola; *spurecata* (p. 34), Gaboon; *costalis* (p. 35), West Africa; *tripartita*, Orizaba; *tenebrosa* (p. 36), Natal; *scripta* (p. 183), South Africa; *pilipes* (p. 184), Cape. *Nauphoeta adjuncta* (p. 38), Cambodia; *discoidalis* (p. 39), New Guinea and Waigiou; *ruficeps*, South Africa; *signifrons* (p. 40), South Africa; *munda* (p. 41), Cape; *marginalis*, locality unknown; *lampyroides* (p. 42), Cape; *foveolata*, South Africa; *gallulosa* (p. 184), Brazil; *rubricosa* (p. 185), South Africa. *Culama* (gen. nov.) *pilosa* (p. 44), Brazil. *Proscatea*? *illepida* (p. 185), St. Domingo.—**ZETOBORIDÆ**: *Zetobora monastica* (p. 45), Brazil; *perspicua* (p. 46), Para; *rudis*, Ega; *antica* (p. 47), Australia; *rugosa*, locality unknown; *formicata* (p. 48), Philippines; *sordidula*, Natal; *congrua* (p. 49), Natal; *abscissa*, Natal; *aspera* (p. 50), South Africa; *sigillata* (p. 51), Honduras; *leucophthalma* (p. 186), Natal; *cervina*, Natal; *flecicollis* (p. 187), Singapore; *pilosa*, Java. *Catara* (gen. nov.) *rugicollis* (pp. 52, 53), Borneo.—**HORMETICIDÆ**: *Brachycola interna* (p. 188), Amazons; *subincta*, Cambodia.—**DIPLOPTERIDÆ**: *Prosoplecta coccinelloides* (p. 56), Philippines; *quadriplagiata* (p. 189), Batchian; *gutticollis*, Ceram; *trifaria* (p. 190), Ceram; *megaspila*, Batchian. *Diploptera silphoides* (p. 57), Philippines; *galerucoides*, Tasmania.—**CORYDIDÆ**: *Corydia plagiata* (p. 58), India. *Euthyrappha mordelloides* (p. 59), Orizaba; *dasytoides* (p. 191), Amoy; *ipsoides*, Para. *Holocompsa debilis* (p. 192), Borneo. *Hypercompsa cynipisoides* (p. 61), Tejuca.—**HYPNORMIDÆ**: *Stenoblatta* (gen. nov.) *parallela* (pp. 192, 193), Brazil. *Hypnorma saperdoides* (p. 62), Santarem; *saperdifformis*, Tapajos; *cucujoides* (p. 63), Rio Janeiro.—**BLATTIDÆ**: *Lupparia* (gen. nov.) *adimonialis* (pp. 65, 66), Philippines. *Riatia* (gen. nov.) *pallicornis*, Ega. *Epilampra conspicua* (p. 67), Lake N'gami; *pardalina* (p. 68), Lake N'gami; *atomaria* (p. 69), Australia; *sabulosa* (p. 70), St. Domingo; *subconspersa* (p. 71), Tejuca; *alligata*, Hong Kong; *adjuncta* (p. 72), Brazil; *sodalis*, Santarem; *repanda* (p. 73), Brazil; *substrigata*, locality unknown; *arctata* (p. 74), British Guiana; *puncticollis*, Sarawak; *buprestoides* (p. 76), Fernando Po; *carabidina*, Sierra Leone; *vasta* (p. 195), Philippines; *amplipennis* (p. 196), Silhet; *præcipua*, Ceylon; *polyspila* (p. 197), Singapore; *sinensis*, Hong Kong; *punctifera* (p. 198), Ceylon; *inclavata*, no locality given; *ozyptera* (p. 199), Sarawak; *congrua*, Sarawak; *conformis* (p. 200), Sarawak, from the stomach of *Phenicophæus erythrognaethus*; *scita*, Sumatra; *deplanata* (p. 201), locality unknown; *insueta* (p. 202), Philippines; *notabilis*, Australia;

laticollis (p. 203), Australia; *munda*, Hong Kong; *pandeus* (p. 204), Philippines; *isochroma* (p. 204), Hong Kong; *subsparsa* (p. 205), Ceylon; *intacta*, Bengal; *curta*, Philippines; *pustulata* (p. 206), Philippines; *opaca*, Demerara; *caliginosa* (p. 207), Tejuca; *conferta*, Brazil; *microspila* (p. 208), St. Domingo; *stipata*, Sierra Leone; *characterosa* (p. 209), Bengal; *quadrinotata*, Sarawak; *plena* (p. 210), Celebes; *fervida* (p. 211), Borneo, Celebes, and New Guinea; *basistriga*, locality unknown. *Pseudomops melana* (p. 80), Brazil; *mimica*, Para; *femoralis* (p. 81), Brazil; *angusta*, Santarem; *concinna* (p. 82), Tejuca; *deceptura*, locality unknown; *lituriceps* (p. 83), Ega; *melandryoides* (p. 84), St. Paulo; *inclusa* (p. 212), Brazil; *scutigera*, Borneo; *fissa* (p. 213), Sumatra; *pica*, Singapore and Sumatra. *Ellipididum subcinctum* (p. 85), China and Cambodia; *ventrale*, Philippines; *laterale* (p. 213), India; *speciosum* (p. 214), Malay archipelago. *Blatta dermestoides* (p. 95), Penang; *consocia* (p. 96), Penang; *hydrophoroides*, Australia; *flaviceps* (p. 97), Rio Janeiro; *gyrinoides*, Ceylon; *latimarcus*, Hong Kong and Honduras; *megaspila* (p. 98), Java; *vitrocincta*, Santarem; *perlucida* (p. 99), Tejuca; *poststriga*, locality unknown; *parana* (p. 100), Para; *arborifera*, Penang; *beauvoisii* (p. 101), Sierra Leone; *insularis*, Jamaica; *mundicola*, Australia; *facies* (p. 102), locality unknown; *lepidella*, Constancia; *reticulosa* (p. 103), Jamaica; *inguinata*, Australia; *cistelina* (p. 104), Brazil; *macroptera*, Natal; *partita*, locality unknown; *fulvipes* (p. 105), Sierra Leone; *lituricollis*, Amoy; *opaca*, Ceylon; *santarema* (p. 107), Santarem; *marginifera*, Australia; *parvula* (p. 108), India; *vitrifera*, Santarem; *isomorpha*, Hong Kong; *conjuncta* (p. 109), New Zealand; *incisa*, St. Domingo and Mauritius?; *parilis* (p. 110), China; *apicifera*, Australia; *platysoma* (p. 111), Swan River; *discalis*, Swan River; *variegata* (p. 112), Para. *Ischnoptera clava* (p. 114), Tejuca; *vacillans*, St. Domingo; *dimidiata* (p. 116), Natal; *longipennis* (p. 117), South Africa; *natalensis*, Natal; *melasa* (p. 118), Santarem; *nigricollis*, Georgia; *marginalis* (p. 119), Swan River; *centralis* (p. 120), South Australia; *lucida*, Pernambuco; *quadriplaga* (p. 121), Mauritius; *rubiginosa*, Santarem; *hebes* (p. 122), Santarem; *terminalis*, Jamaica; *ruficeps* (p. 123), Natal; *biligata* (pp. 123 and 227), Ceylon and Celebes. *Periplaneta repanda* (p. 125), Honduras, St. Domingo, Philippines, Ceram; *subcincta* (p. 126), Oajaca; *inclusa*, St. Domingo and New Hebrides; *patens* (p. 127), Congo; *jucunda* and *stolida* (p. 128), localities unknown; *apicalis* (p. 129), Australia; *contraria* (p. 131), Philippines; *flexivitta* (p. 133), Congo; *fusata*, East Africa; *curvigera* (p. 134), Moreton Bay; *biquadrata*, Australia; *concolor* (p. 135), locality unknown; *floridana*, North America; *lateralis* (p. 136), Egypt; *fortipes* (p. 137), New Zealand and Australia; *invisa*, Australia; *tetra* (p. 138), South Africa; *coxalis*, Ceram; *polita* (p. 139), Formosa; *glabra*, Australia; *bimaculata*, Natal; *semicincta* (p. 140), Navigators' Isles and Formosa; *inclusa**, locality unknown; *semipicta* (p. 141), Florida; *sexguttata*, Australia; *collaris* (p. 142), Natal; *decorata*, South Africa; *circumducta* (p. 143), locality unknown; *semivitta*, Swan River; *undulivitta* (p. 144), New Zealand; *marginifera*, King George's Sound; *configurata* (p. 145), Java; *inscripta*, Natal; *insolita* (p. 146), Java. *Nyctibora tenebrosa* (p. 147), Demerara; *stygia* (p. 148), St. Domingo and Honduras. *Paratropes lanceolatus* (p. 150), Cuenca; *bivitta*, Amazons; *pica* (p. 151), Ega. *Polyzosteria lateralis* (p. 154), Australia;

* *Bis!* vide p. 126.

nitens (p. 155), locality unknown; *signata*, South Africa; *aversa* (p. 156,, South Africa; *femoralis*, Swan River; *patula* (p. 157), North Australia; *figurata*, Australia; *ferruginea* (p. 158), Australia; *geochroma*, locality unknown; *zonata* (p. 159), Australia; *polyzona*, Australia; *quadrifascia* (p. 160), Australia; *pectoralis*, North Australia; *propria* (p. 161), Australia and Philippines; *antica*, locality unknown; *invisa* (p. 162), Australia; *tarsalis*, Australia; *purpurea* (p. 163), locality unknown; *terranea*, Ceylon; *panethoides* (p. 164), Jamaica; *latipes* (p. 165), Sierra Leone; *congrua* (p. 165), Congo; *crassipes* (p. 166), river Napo; *nitens*, Tejuca; *limbata* (p. 167), Australia; *limosa*, South Africa.—**PERISPHERIDÆ**: *Perisphæria crassa* (p. 169), Cape; *multicincta*, South Africa; *alta* (p. 170), Silhet; *tarsalis* (p. 171), Cambodia and Tenasserim; *solida*, South Africa; *fallax* (p. 172), Australia; *æqualis*, locality unknown; *scabra*, South Africa; *picea* (p. 173), South Africa; *reflexa*, Natal; *thoracica* (p. 174), locality unknown; *poduriformis* (p. 175), Cape; *poduroides*, Natal; *cylindrica* (p. 176), Natal; *linearis*, Natal; *æqua* (p. 177), locality unknown; *murrina* (p. 178), East Africa; *terrestris*, South Africa; *laminata*, Australia; *lignaria* (p. 179), Rio Janeiro; *cercalis* (p. 214), locality unknown; *detersa* (p. 215), Jamaica; *deprivata*, locality unknown; *flexivitta* (p. 216), Santarem; *ruricornis*, Santarem; *perloides* (p. 217), Brazil; *calogramma* (p. 217), Brazil; *fragilis* (p. 218), Brazil; *glabrícula*, Brazil; *annulicornis* (p. 219), Para; *erythrina*, Brazil; *reducta* (p. 220), West Africa; *centa*, Congo; *amæna*, West Africa and Natal; *extenuata* (p. 221), Egypt; *colligata*, China; *polygrapha*, Siam; *suffusa* (p. 223), New Guinea; *lativitreæ*, Cambodia; *amplectens*, Morty; *hamifera* (p. 224), Sarawak; *ignobilis*, Sula; *funebis* (p. 225), Sarawak; *palpalis*, Sarawak; *obtusifrons* (p. 226), Sarawak; *elegans*, Sarawak; *apicigera* (p. 227), Java; *propinqua* (p. 228), Celebes; *contigua*, New Guinea; *contingens* (p. 229), Sarawak; *sequens*, Celebes; *guttifera* (p. 230), Aru; *xanthophila*, Celebes; *laterifera* (p. 231), Sarawak; *virescens*, Sarawak.

WALKER (Supplement Blatt.) characterizes an additional new genus, and new species, as follows:—*Zetobora guttipennis* (p. 123), South Mexico. *Epilampra dotata* (p. 130), Singapore and Sarawak; *varia*, Sarawak; *adusta* (p. 131), Sarawak; *basifera*, Ceram; *strigifrons* (p. 132), Philippines; *ramifera*, Sumatra; *polyspila* (p. 133), Sarawak; *parvicollis*, Sarawak; *concinula* (p. 134), Timor. *Blatta majuscula* (p. 139), Siam; *marmorata* (p. 140), Malacca; *humeralis*, Singapore; *picticollis*, Celebes; *bipunctata* (p. 141), Celebes; *laticeps* (p. 142), Singapore; *circunducta*, Australia; *longiuscula* (p. 143), South Australia; *patula*, Sydney; *latirupta*, New South Wales. *Ischnoptera melanophila* (p. 146), Zanzibar; *hastifera* (p. 147), South Africa; *reversa*, Singapore; *sinensis* (p. 148), Hong Kong; *conferta*, Siam; ? *obliqua*, Brazil; ? *sicca* (p. 149), Santarem; ? *punctosa*, Australia. *Periplaneta aterrima* (p. 151), Peru; *oculata* (p. 152), Australia; *convexa*, Moreton Bay. *Tivia* (gen. nov.) *simulatrix* (p. 153), Lake N'gami.

MANTIDÆ.

SAUSSURE (Mitth. schw. ent. Ges. iii.) gives a supplement to his "Essai d'un Système des Mantides," noticed at length in the Zool. Rec. 1869. Additional materials induce him to modify his first arrangement, and a number of amended tables are given, which are too lengthy to reproduce here. According to him, the genus *Oxyphilus* belongs to the *Empusites*, and not to the

Eremaphiliæ. *Chiropus* should be united to *Chiropacha*. *Miopteryx* should be placed among the *Thespites*. *Hymenopa* was included among the *Acanthopsites* by mistake; it should be ranged with the *Harpacites*. *Gonatista cubensis*, Sauss., = *Mantis phryganoides*, Serv.; *Coptopteryx daraziana*, Sauss., = *Mantis crenaticollis*, Blanch.; *Cardioptera translucida*, Sauss., = *C. vitrea*, Burm.

SAUSSURE (*Mélanges Orthoptérologiques*) gives a monograph of the Old-World species of this family, in amplification of his previous paper in the *Mitth. schw. ent. Ges.* After prefacing his memoir by considerations of the characters, he gives the following table as an outline of his system:—

- A. Corpus et pedes non appendiculata. Antennæ in utroque sexu simplices, setacæ vel pilosellæ. (Pedes simplices scilicet teretes vel unicarinati, nec lobati, nec cristati. Vertex non conoideo-productus. Abdominis thoracisque margines non lobati, genere *Gonatista* excepto. Elytra simplicia, marginibus integris.) NUDIPEDES.
- a. Prothorax supra coxas antice dilatationem nullam efficiens, sed marginibus parallelis, vel caput versus latius marginibus subflexuosis. *Orthoderii*.
- b. Pronotum supra coxas dilatationem ovatam efficiens, apice antico attenuato *Mantii*.
- B. Pedes vel corpus appendiculata. (Pedes interdum lobati vel cristulati; abdominis vel thoracis margines frequenter dilatati; vertex interdum conoideo-productus; elytra interdum excisa marginibus sinuatis.)
- LOBIPEDES.
- a. Antennæ in utroque sexu simplices, setacæ *Harpagii*.
- b. Antennæ plerumque in maribus pectinatæ vel serratæ; pedes plerumque multicarinati *Empusii*.

On his three plates he figures numerous species, either entirely or with regard to special characters. The New-World species are to be worked out in the "Mission scientifique au Mexique et dans l'Amérique centrale," the printing of which work was stopped for a time by the events of the war.

Empusa brachyptera. Mäklin (Öfv. Fin. Soc. 1870, pp. 35, 36) notices the occurrence of this species in Finland.

New genera:—

Parablepharis, Saussure, *Mitth. schw. ent. Ges.* iii. p. 222. Differs from *Phyllocrania* in having the horn of the vertex short, pyramidal, and nearly divided at the apex. Type *P. kuhlii*, De Haan.

Paraorypilus, Saussure, *l. c.* p. 224. (Subtribe *Mantites*.) Supraanal lamina elongate; head and thorax with spines; margins of the abdomen dilated; female apterous. Two new species, noticed below.

Miomantis, Saussure, *l. c.* p. 225. Allied to *Miopteryx*. Sexes unequal; elytra of the female equalling the abdomen, opaque; those of the male long and membranaceous. Type *M. forficata*, Stoll.

Pseudomiopteryx, Saussure, *l. c.* Allied to *Miopteryx*. Body somewhat short; front mucronate in the region of the inferior ocellus. Two new species, noticed below.

Micromantis, Saussure, *l. c.* Allied to *Archimantis*. Cerci tubular, nor-

mal; sexes similar; thorax short; wings longer than the abdomen. Type *M. glauca*, Sauss.

Acromantis, Saussure, *l. c.* p. 226. Allied to *Gonypeta*. Frontal scutellum mucronate above; elytra of the female membranaceous, marginal area opaque. Two new species, noticed below.

Mesopteryx, Saussure, *l. c.* p. 235. (Subtribe *Thespites*.) Intermediate between *Tenodera* and *Phasmomantis*. Margins of the prothorax lamellate, parallel; wings of the female shorter than the abdomen, hyaline; legs slender. Type a new species, noticed below.

Euchomena, Saussure, *l. c.* p. 235. Differs from *Danuria* in the feet being deprived of lobes; from *Thespis* by the length of the wings, and by the short supraanal lamina. Two new species, noticed below.

Oxythoespis, Saussure, *l. c.* p. 239. Allied to *Thespis*. Eyes laterally spined; antennæ with long hairs, nearly plumose. Two new species, noticed below.

Pseudocreobotra, Saussure, *l. c.* p. 244. (*Harpacites*.) Allied to *Creobotra*. Eyes scarcely conical; margins of the prothorax dilated; abdomen perfoliate beneath, the margins dilated. Type *P. ocellata*, Pal. de B.

Pseudoharpax, Saussure, *l. c.* Allied to *Harpax*. Margins of the prothorax and abdomen not dilated; clypeus subcarinate. Type *P. virescens*, Serv.

Paracanthops (*Pseudocanthops* [sic] in table), Saussure, *l. c.* p. 243. Differs from *Acanthops* in the vertex being armed with a split horn; tibiae perfoliate. Types *P. celebs*, Sauss., and a new species noticed below.

Nanomantis, Saussure, Mélang. Orthop. 3^e fascic. p. 263. Head much compressed, transverse, short, facial scutellum linear. Prothorax very slender, moderate. Elytra reaching to or extending beyond the apex of the abdomen, membranaceous, more or less reticulated in colour. Wings narrow, not coloured, discoidal vein bifurcate. Anterior legs slender, the thighs short, slightly dilated. Abdomen of the female slender, linear; supraanal lamina small, lanceolate, acute, and carinate. Male unknown. Type *N. australis*, n. sp., *l. c.* p. 264, Australia.

New species :—

SAUSSURE (Mitth. schw. ent. Ges. iii.) describes the following new species :—THEOCLYTITES : *Vates denticulata*, *l. c.* p. 222, Surinam; *Pseudovates consobrina*, *l. c.*, Brazil.—EMPUSITES : *Phyllocrania undulata*, *l. c.*, Asiatic islands? *Idolomorphus longifrons*, *l. c.* p. 224, Turin.—MANTITES : *Paraoxypilus tasmaniensis*, *l. c.* p. 227, Tasmania; *verreauxii*, *l. c.*, Tasmania. *Pseudomiopteryx spinifrons*, *l. c.* p. 228, Brazil; *bogotensis*, *l. c.*, Bogota. *Pseudomantis nemorulis*, *l. c.* p. 229, Manilla. *Acontista multicolor*, *l. c.*, Guadaloupe; *roseipennis*, *l. c.*, Guiana; *bimaculata*, *l. c.*, Brazil. *Stagmomantis vicina*, *l. c.*, South America. *Acromantis formosa*, *l. c.* p. 230, Silhet; *javana*, *l. c.*, Java. *Gonypeta delalandi*, *l. c.*, South Africa; *femorata*, *l. c.*, Arabia?; *irina*, *l. c.* p. 244, Moluccas. *Coptopteryx? stollii*, *l. c.* p. 230, Surinam. *Stagmatoptera pagana*, *l. c.* p. 232, Bogota; *veneratoria*, *l. c.*, South America; *predicatoria*, *l. c.*, Brazil. *Hierodula tectifformis*, *l. c.*, Bombay; *rhomboidalis*, *l. c.* p. 233, India; *trimacula*, *l. c.*, Sina [Sinai]?; *manillensis*, *l. c.*, Manilla; *grandis*, *l. c.*, Silhet. *Mantis orientalis*, *l. c.*, India. *Tenodera intermedia*, *l. c.*, New Zealand.—THESPITES : *Mesopteryx alata*, *l. c.* p. 235, Manilla. *Phasmo-*

mantis infuscata, l. c., Brazil? *Euchomena madecassa*, l. c. p. 236, Madagascar; *manillensis*, l. c., Manilla. *Miopteryx granadensis*, l. c. p. 237, Bogota; *argentata*, l. c., Argentine Republic; *madagascarensis*, l. c., Madagascar; *lactea*, l. c., Manilla; *pellucida*, l. c. p. 238, Senegal; ? *macrops*, l. c., Cochin China. *Thespis conspersa*, l. c., South America; ? *caudata*, l. c., Brazil. *Oxythespis senegalensis*, l. c., p. 239, Senegal; *granulata*, l. c., Senegal. *Oligonyx scudderi*, l. c., North America; *subhyalina*, l. c., Brazil. *Brunneria gigas*, l. c. p. 240, South America; *brasiliensis*, l. c., Brazil.—CHÆRADODITES: *Deroplatys siccifolium*, l. c., India?—HARPACITES: *Creobotra levicollis*, l. c. p. 242, Java; *fuscoareata*, l. c., Siam; *granulicollis*, l. c., Siam? *Acanthops tessellata*, l. c. p. 243, Chiquitos; *tuberculata*, l. c., Guiana. *Paracanthops spinulosa*, l. c. p. 243, Guiana.

Iridopteryx micans, Sauss. Mélang. Orthop. 3^e fascic. p. 342, Central India; *Cardioptera humeralis*, l. c. p. 343, South Africa; *reticulata*, l. c. p. 344, South Africa?; *Hierodula robusta*, l. c. p. 221, fig. 53, India; *Iris fraterna*, l. c. p. 257, India; *caucasica*, l. c. p. 258, Caucasus; *moerri*, l. c. p. 262, Turkestan; *Thespis ocellata*, l. c. p. 278, India.

GRYLLIDÆ.

WALKER (Cat. Dermap. Saltatoria) describes the following new genera and new species belonging to this family:—*Gryllotalpa grandis* (p. 5), Tenasserim, Java, Philippine Isles; *ornata*, India; *coarctata* (p. 6), North Australia; *Brachytrypes terrificus* (p. 10), Madras; *ferreus* (p. 11), Madras; *bisignatus*, India; *truculentus* (p. 12), India; *robustus*, Philippine Isles; *fulvus*, no locality; *Gryllus septentrionalis* (p. 18), Mexico, St. Domingo, West Coast of America; *luridus*, Vera Cruz; *determinatus* (p. 19), West Indies; *parilis* (p. 20), St. Vincent, Brazil; *similaris*, St. Domingo; *angustulus* (p. 21), West Indies; *contingens*, West Indies; *signatipes* (p. 22), West Coast of America; *comptus* (p. 23), Constanca; *mundus*, Brazil; *signatus* (p. 24), Venezuela; *vicarius*, Para; *marginalis* (p. 25), Madeira; *pygmaeus*, Egypt; *fortipes* (p. 26), Natal; *guttatus* (p. 27), Sierra Leone; *plagiceps*, Congo; *lineaticeps* (p. 28), Sierra Leone; *notabilis*, Sierra Leone; *ignobilis* (p. 29), Natal; *macrurus*, Fantee; *atratus* (p. 30), West Africa, Abyssinia; *posticus*, Sierra Leone and East Africa; *compactus* (p. 31), Natal; *consocius*, South Africa; *parallelus*, Natal; *lucens* (p. 32), Sierra Leone; *madagascarensis*, Madagascar; *ater* (p. 33), Syria; *concisus* (p. 34), Birmah; *spurcatus* (p. 35), Hong Kong; *interruptus*, Hong Kong; *conscitus*, Nepal; *supplicans* (p. 36), Ceylon; *minusculus*, Amoy; *tenellus* (p. 37), Ceylon; *confirmatus*, Ceylon; *signifrons* (p. 38), North India; *testaceus*, China; *clavus* (p. 39), Ceylon; *asperus*, Hong Kong; *atratus* (p. 40), Philippine Isles; *consimilis* (p. 41), Philippine Isles; *miser*, Borneo; *diminuens* (p. 43), Australia; *parvulus*, Australia; *comparatus* (p. 44), Australia; *lineiceps*, Australia; *commodus* (p. 45), West Australia; *diminutus*, South Australia; *lepidus* (p. 46), South Australia; *sigillatus*, Swan River; *minusculus* (p. 47), Australia; *innotabilis*, Loo Choo. The following species are from uncertain localities:—*simplex* (p. 48); *nigerrimus* (p. 49); *erythrospilus*, *collocatus*, *hirsutulus* (p. 50); *pallidissimus*, *fasciatus*, *pustulipes* (p. 51). *Tafahica* (gen. nov.) *lurida* (pp. 52, 53), St. Domingo; *Carsidava* (gen. nov.) *cinerascens* (pp. 53, 54), Para; *Nessa* (gen. nov.) *linearis* (p. 54), South America; *fortipes* (p. 55),

Natal: *Landreva* (gen. nov.) *insignis* (p. 55), Ceylon: *Nemobius mexicanus* (p. 57), Oajaca; *basalis* (p. 58), Para; *picinus*, Amazons; *indicus*, India; *bivittatus* (p. 59), Swan River; *australis*, Australia; *heteropus* (p. 60), Australia: *Argizala* (gen. nov.) *brasiliensis* (pp. 60, 61), Brazil: *Orocharis signatus* (p. 61), Orizaba; *scitulus* (p. 62), Honduras; *affinis*, Santarem; *fusiformis* (p. 63), Honduras: *Itara* (gen. nov.) *sericea* (p. 64), Silhet: *Madasumma* (gen. nov.) *ventralis* (pp. 64, 65), North India: *Lobeda* (gen. nov.) *ovalis* (pp. 65, 66), Natal: *Eneoptera insularis* (p. 66), Jamaica; *incompta* (p. 67), Tapajos; *lanceolata*, Brazil; *fascipes*, North India: *Phyllopalpus latipennis* (p. 68), Jamaica; *comptus* (p. 69), Para; *elegans*, Santarem; *pulcher*, Amazons; *nigrovarius* (p. 70), Mexico; *gracilis*, Natal; *lycoides* (p. 71), Ceylon: *Eurepa* (gen. nov.) *marginipennis*, Swan River: *Lerneca* (gen. nov.) *varipes* (p. 72), Amazons: *Salmunia* (gen. nov.) *sordida* (p. 73), North Australia: *Scleropterus erythrocephalus* (p. 74), Natal; *ater*, Sierra Leone; *maoricus*, New Zealand: *Lebussa* (gen. nov.) *tenuicornis* (p. 75), St. Domingo: *Platydictylus consimilis* (p. 76), doubtful locality; *columbicus* (p. 77), Columbia; *velutinus*, Santarem; *similis* (p. 78), St. Domingo; *contiguus*, Para; *caliginosus* (p. 79), British Guiana; *planus*, Brazil; *africanus* (p. 80), Natal; *fuliginosus*, Natal; *transversus* (p. 81), Silhet; *planus*, North India; *pallidus* (p. 82), Silhet; *indecorus* (p. 83), Siam; *præcipus*, Ceylon; *varipennis* (p. 84), Ceylon; *notabilis* (p. 85), Ceram; *varius* (p. 86), Ceram; *signatipennis*, Celebes; *australis* (p. 87), Australia; *continuus*, South Australia; *subnotatus* (p. 88), unknown locality: *Laranda* (gen. nov.) *tibialis* (pp. 88, 89), Rio Janeiro: *Zaora* (gen. nov.) *cinctipes* (p. 89), Jamaica; *morbillosa* (p. 90), South Africa; *pardalis*, North Australia: *Orbega* (gen. nov.) *pallida* (p. 91), uncertain locality; *Nisitra* (gen. nov.) *marginata* (pp. 91, 92), Sumatra: *Oecanthus nigricornis* (p. 93), Illinois; *varicornis* (p. 94), Mexico; *formosus*, Mexico; *peruvianus* (p. 95), Peru; *tenuis*, Santarem; *sinensis*, China; *lineatus* (p. 96), Moreton Bay and Fijis: *Laurepa* (gen. nov.) *valida*, Jamaica; *discalis* (p. 97), Natal; *congrua* (p. 98), Philippine Isles; *australis*, Australia; *frontalis* (p. 99), North Australia; *unicolor*, Navigators' Islands; *obscurella*, uncertain locality: *Tarraga* (gen. nov.) *obscura* (p. 100), India: *Nocera* (gen. nov.) *pallida* (p. 101), Samoa, identified at p. 214 with *Litrosceles pectinata*, Guérin: *Trigonidium taprobanense* (p. 102), Ceylon: *Luzara* (gen. nov.) *rufipennis* (p. 103), Columbia; *ferruginea*, Ceylon: *Phalangopsis albicornis* (p. 106), North India; *longicornis*, Singapore; *picticeps* (p. 107), India; *spectrum* (p. 108), Tejuca: *Xabea* (gen. nov.) *decora* (p. 109), Sumatra.

Gryllotalpa siamensis, Giebel, Z. ges. Naturw. 1870, i. p. 48, Siam.

LOCUSTIDÆ.

Opomala sicula, Serv. GHILLIANI (Bull. Ent. Ital. 1870, pp. 138, 139) identifies this insect with *O. cylindrica*, Marshall (= *fasciculata*, Charp.), which name has priority.

Anabrus. THOMAS (P. Ac. Philad. 1870, p. 74) redescribes this genus, and considers that it differs so little from *Thyreonotus* that its retention is scarcely necessary.

Deinacrida. BULLER (Zool. s. s. 1867, pp. 849, 850) describes two known species of this genus from New Zealand, *heteracantha* and *thoracica*. The former is very tenacious of life, but is gradually becoming extinct, which is

attributed by the natives to the introduction of the Norway rat. The latter infests the decayed wood of *Coriaria sarmentosa*, into which it bores.

WALKER (Cat. Dermap. Saltatoria) describes the following new genera and new species as belonging to this family:—*Monocerophora* (gen. nov.) *minax* (pp. 157, 158), Pernambuco: *Anostotoma femoralis* (p. 159), unknown locality: *Hemedaina* (gen. nov.) *capitolina* (pp. 160, 161), New Zealand; *figurata* (p. 162), New Zealand; *abbreviata* (p. 163), New Zealand (in caves); *producta*, New Zealand; *tibialis* (p. 164), New Zealand; *attenuata*, New South Wales; *fusifera* (p. 165), Richmond River, Australia: *Licola* (gen. nov.), formed for *Anostotoma coultoni* (Sauss.): *Gryllacris plagiata* (p. 167), Silhet; *spurcata*, unknown locality; *marginata* (p. 168), Sarawak; *vittipes*, Philippine Isles; *contracta* (p. 169), India; *vittata* (p. 170), Tenasserim; *maculipes* (p. 171), Corea and (var. ?) Sarawak; *punctipennis* (p. 172), Batchian; *ornata*, Moreton Bay; *lineosa* (p. 173), unknown locality; *discoidalis* (p. 174), unknown locality; *atrata*, Sarawak; *formosa* (p. 175), Sarawak; *insignis* (p. 176), Sydney; *aliena* (p. 177), Silhet; *postica* (p. 178), unknown locality; *signigera*, Australia; *genualis* (p. 179), unknown locality; *longa* (p. 180), Port Stephen; *piceifrons*, Ceram or Amboina; *perloides* (p. 181), Australia; *scita*, India; *collaris* (p. 182), Silhet; *nobilis*, Singapore; *nasalis* (p. 183), Philippine Isles; *uniguttata*, Australia; *arctata* (p. 184), Philippine Isles; *leta*, Amoy; *venosa* (p. 185), Sarawak; *gracilis*, India; *munda* (p. 186), Australia; *macrocera*, New Hebrides; *angusta* (p. 187), South Australia; *basalis* (p. 188), Bombay; *combinata*, Tasmania; *incerta* (p. 189), unknown locality; *insolita*, Tasmania: *Larnaca* (gen. nov.) *fasciata* (pp. 190, 191), Sarawak; *Stenopelmatus politus* (p. 193), Orizaba; *erythromelas*, Mexico; *lycosoides*, Mexico; *pallidus* (p. 194), unknown locality; *cephalotes* (p. 195), West Coast of America; *guttifrons* (p. 196), Swan River; *piceiventris* (p. 197), unknown locality; *zonatus*, unknown locality; *pinguis* (p. 198), South Africa; *bicolor* (p. 199), Cape: *Lezina* (gen. nov.) *concolor* (pp. 199, 200, and 477), Egypt; *Ceuthophilus scriptus* (p. 202), unknown locality; *zonarius* (p. 203), Vancouver's Island; *guttatus*, unknown locality; *lanceolatus* (p. 204), New Zealand (in caves): *Macropathus* (gen. nov.) *filifer* (p. 206), *fascifer* (p. 207), and *altus* (p. 208), all from New Zealand (in caves): *Libanasa* (gen. nov.) *incisa*, Natal; ?? *maculifrons* (p. 209), New Zealand: *Machamala* (gen. nov.) *armata* (pp. 209, 210), unknown locality: *Licodia* (gen. nov.) *pallipes*, St. Domingo; ?? *obliqua* (p. 211), unknown locality: *Lutosa* (gen. nov.) *marginalis* (pp. 211, 212), unknown locality: *Lucina* (gen. nov.) *opilioides* (pp. 212, 213), Brazil; *palliceps*, Cambodia: *Hetrodes marginatus* (p. 226), Cape; *productus* (p. 227), Congo; *abbreviatus*, South Africa; *macrurus* (p. 228), unknown locality; *fortis* (p. 229), South Africa; *vittatus*, South Africa; *discoidalis* (p. 230), South Africa; *crassipes* (p. 231), South Africa; *pallidus*, East Africa: *Lesina* (gen. nov.) *lutescens* (pp. 231, 232), Amboina: *Ephippiger australis* (p. 238), Swan River: *Odontura capensis* (p. 242), South Africa: *Ochrida* (gen. nov.) *annulipes* (pp. 244, 245), Australia: *Ocica* (gen. nov.) *lutescens* (pp. 245, 246), Ovalu: *Thryeonotus basalis* (p. 247), South Africa; *viridifer* (p. 248), Natal: *Requena* (gen. nov.) *verticalis* (pp. 248, 249), Swan River: *Pallota* (gen. nov.) *inornata* (pp. 249, 250), Sierra Leone: *Neduba* (gen. nov.) *carinata* (pp. 250, 251), California: *Marsa* (gen. nov.) *arcuata* (pp. 253, 254), Saskatchewan: *Decticus sphagnum* (p. 258), Hud-

son's Bay; *concinus* (p. 260), Nepal; *sinensis* (p. 261), Amoy; *obscurus*, Corea; *pallidus* (p. 262), North India; *tenebrosus* (p. 263), Philippines and Corea; *semivittatus*, New Zealand; *frontalis* (p. 264), unknown locality: *Lucera* (gen. nov.) *bicoloripes* (p. 265), Macao: *Dezerra* (gen. nov.) *turpis* (pp. 265, 266), Australia: *Natricia* (gen. nov.) *ochracea* (pp. 266, 267), China: *Insara* (gen. nov.) *strigulata* (pp. 267, 268), Mexico: *Xiphidium grande* (p. 270), Demerara; *præcipuum* (p. 271), Demerara; *continuum*, Sierra Leone; *punctipenne* (p. 272), South Africa; *tenue*, South Africa; *tenellum*, Natal; *caudale* (p. 273), Natal; *exemptum* (p. 274), Corea; *posticum*, Silhet; *albescens* (p. 275), South Australia; *maoricum* (p. 276), New Zealand; *validum* (p. 277), unknown locality: *Letna* (gen. nov.) *linearis* (pp. 277, 278), North India: *Ladena* (gen. nov.) *punctipes* (pp. 279, 280), North India: *Lanciana* (gen. nov.) *albidicornis* (pp. 280, 281), Australia: *Piura* (gen. nov.) *munda* (pp. 281, 282), Ceram: *Locusta marginifera* (p. 284), Africa; *repanda*, unknown locality; *deticoides* (p. 285), Australia; *bicolor* (p. 286), unknown locality: *Nicsara* (gen. nov.) *trigonalis* (pp. 286, 287), Australia: *Mossula* (gen. nov.) *vitticollis* (pp. 287, 288), unknown locality: *Moucheca* (gen. nov.) *pretiosa* (p. 289), Honduras and Mexico: *Saga lutea* (p. 292), Swan River; *parvula* (p. 293), Sandwich Islands; *maculosa* (p. 294), South Africa: *Agræcia solida* (p. 295), Australia?, New Zealand; *rugifrons* (p. 297), Fijis; *vittifrons* (p. 298), Philippines; *sparsa*, Sarawak; *tetra* (p. 299), Philippines; *phæopsis*, Australia: *Montesa* (gen. nov.) *nigridentis* (p. 300), Tapajos: *Secsiva* (gen. nov.) *univittata* (p. 301), North Australia: *Conocephalus contingens* (p. 304), Mexico; *ascendens* (p. 305), Jamaica; *bilineatus* (p. 306), St. Domingo; *gracillimus* (p. 307), Brazil; *alienus* (p. 308), Guyaquil; *viridator*, Honduras; *alligatus*, Para; *colligatus* (p. 309), Columbia and Brazil; *purpurascens*, Demerara; *simulator* (p. 310), Brazil?; *latifrons*, Venezuela; *exaltatus* (p. 311), Venezuela; *annulicornis* (p. 312), Natal; *porrigens* (p. 313), Natal; *indicator*, South Africa; *diversus* (p. 314), South Africa; *obscurus*, Sierra Leone; *amplus* (p. 315), Natal; *consobrinus*, South Africa; *vicinus* (p. 316), West, South, and North Africa; *subvittatus*, Natal; *abruptus* (p. 317), Madagascar; *interruptus* (p. 318), North Bengal; *lineosus*, China; *dorsalis* (p. 319), China; *strenuus*, North India; *varius* (p. 320), China and Silhet; *incertus*, Ceylon; *femoralis* (p. 321), China?; *rosaceus*, North China; *spatulatus* (p. 322), China; *concisus*, China; *turpis* (p. 323), Philippines; *alienus* (p. 324), Java; *clavus*, Sumatra; *insularis* (p. 325), Navigators' and Sandwich Islands; *remotus* (p. 326), Sandwich Islands; *nobilis*, *vittipennis* (p. 327), *abbreviatus*, *intactus* (p. 328), *latipennis*, *restrictus* (p. 329), and *extensor*, localities unknown: *Pseudorhynchus*? *colorificus* (p. 330), Brazil; *pauperculus* (p. 331), Australia: *Copiophora*? *flavoscripta* (p. 332), Venezuela: *Panacanthus* (gen. nov.) *varius* (pp. 332, 333), Quito: *Storniza* (gen. nov.) *pallicornis* (pp. 333, 334), Bogota: *Phaneroptera continua* (p. 337), South Africa; *attenuata* (p. 338), South Africa; *vicaria*, Natal; *lurida* (p. 339), Natal; *plana*, Natal; *turbata* (p. 340), Congo; *melanocantha* (p. 341), Ceylon; *neochlora* (p. 342), China; *punctifera*, Silhet; *roseata* (p. 343), North India; *privata* (p. 344), Silhet; *insignis*, Silhet; *notabilis* (p. 345), Silhet; *diversa* (p. 346), Silhet; *aliena* (p. 347), Silhet; *nobilis* (p. 348), Australia; *strenua* (p. 349), Australia; *pinguis* (p. 350), Moreton Bay; *glaucescens*, King George's Sound; *congrua* (p. 351), New South Wales; *subroseata*, Australia; *valida* (p. 352), South Australia; *simplex*, Sydney; *extenuata* (p. 353), Swan

River; *albidiceps* (p. 354), Australia; ? *tenuis*, North Australia; *albida* (p. 355), unknown locality; *Ephippitytha*? *pardalis* (p. 356), Silhet; *Valna* (gen. nov.) *melaleuca* (pp. 357, 358), Rio Janeiro: *Sanabria* (gen. nov.) *fuscescens* (pp. 358, 359), Birmah; *Vellea* (gen. nov.) *rosea* (pp. 359, 360), Para and Demerara: *Sictuna* (gen. nov.) *strigata* (pp. 360, 361), Venezuela: *Viadana* (gen. nov.) *transversa* (pp. 361, 362), Para; *binotata*, Ega; *digramma* (p. 363), Santarem; *Soria* (gen. nov.) *contaminata* (pp. 363, 364), Brazil: *Topana* (gen. nov.) *media* (pp. 364, 365), doubtful locality; *postica*, Santarem; *varia*, Para: *Sagana* (gen. nov.) *subpunctata* (pp. 366, 367), Honduras: *Tinzedda* (gen. nov.) *eburneata* (pp. 367, 368), Australia; *basalis*, Australia: *Monocentrum supremum* (p. 370), Mexico; *excellens* (p. 371), St. Domingo; *subæquale* (p. 372), St. Domingo; *decoratum* (p. 373), St. Domingo; *divisum*, Jamaica; *planum* (p. 374), Santarem: *Diplophyllus strigipennis* (p. 376), unknown locality: *Phylloptera magnifolia* (p. 377), Brazil, Guyaquil; *contracta* (p. 378), Brazil; *fasciata*, Gambia; *natalensis* (p. 379), Natal; *spectabilis* (p. 380), Ceylon: *Orophus notatus* (p. 383), Oajaca; *ringens*, Jamaica; *decisus* (p. 384), Honduras; *planiceps* (p. 385), Para; *strangulatus*, West Africa; *flavescens* (p. 386), Gambia; *compressus*, South Africa: *Torbia* (gen. nov.) *perfecita* (p. 388), Australia: *Itarissa* (gen. nov.) *laurinifolia* (pp. 389, 390), Para: *Steirodon subproductum*, unknown locality; *dentiferum* (p. 391), unknown locality: *Vetralla* (gen. nov.) *quadratum* (pp. 391, 392), Ceylon: *Zedla* (gen. nov.) *sellata* (p. 393), Silhet, Corea, Philippines: *Veria* (gen. nov.) *colorata* (p. 394), Australia: *Gymnocera marginata* (p. 396), Demerara: *Pseudophyllanax* (gen. nov.) *insularis* (p. 398), Isle of Pines: *Pseudophyllus aridus* (p. 399), Congo; *ophthalmicus* (p. 400), East Africa; *assimilis* (p. 401), Silhet; *tener* (p. 402), Ceylon; *venosus* (p. 403), Silhet; *siccus*, Madras and Silhet; *concinus* (p. 404), Silhet; *breviusculus* (p. 405), Ceylon; *detersus* (p. 406), unknown locality; *sinensis*, Hong Kong; *signatus* (p. 407), India; *lituratus* (p. 408), Ceylon; *sublituratus*, India; *opacus* (p. 409), Ceylon; *tenebrosus* (p. 410), Borneo; *teter* (p. 411), Philippines; *parallelus* (p. 412), Java; *fortis* (p. 413), Philippines: *Zumala* (gen. nov.) *robusta*, Ceylon; *exaltata* (p. 414), Ceylon; *mutilata* (p. 415), Ceylon; *cingalensis*, Ceylon: *Apriion carinatum* (p. 426), India and Ceylon; *gracile*, Ceylon; *porrectum* (p. 427), Silhet; *productum* (p. 428), Ceylon; *pustulatum* (p. 429), Ceylon; ? *albisellatum*, Amboina: *Phyllophora inermis* (p. 431), unknown locality; *media*, Ceylon and Ceram (?); *amplifolia*, Tringany: *Zacatula* (gen. nov.) *scabra* (pp. 433, 434), Ceram: *Tabaria* (gen. nov.) *opiloides*, Columbia: *Panoploscelis*? *tuberculata* (p. 436), Para; ? *tuberculosa*, Ega: *Sezava* (gen. nov.), formed to receive *Locusta lanceolata*, Stoll: *Sanaa* (gen. nov., p. 438), formed to receive *Acanthodis imperialis*, White: *Tegra* (gen. nov. p. 439), formed to receive *Locusta novæ-hollandiæ*, Haan: *Meroniciidius subguttatus* (p. 445), Jamaica; *macularis*, unknown locality; *varius* (p. 446), Santarem; *circumdatus*, Oajaca; *tenebrosus* (p. 447), Oajaca; *inficitus*, unknown locality; *discoïdalis* (p. 448), Jamaica; *lativittatus*, Santarem; *subnotatus* (p. 449), Jamaica; *fumosus*, unknown locality; *submarginatus* (p. 450), Para; *marginatus*, Para; *ruficornis* (p. 451), unknown locality; *indistinctus*, Mexico or Brazil; *tessellatus*, Archidona; *marginifer* (p. 452), Brazil; *innotatus*, Bogota; *inornatus* (p. 453), Monte Video; *immunis* (p. 454), Honduras: *Cymatomera spilophora* (p. 455), East Africa; *viridivittata* (p. 456), Malabar: *Mecopoda platyphæa* (p. 458), Ceylon: *Pterochroza pictifolia*

(p. 461), Brazil; *decorata*, Brazil: *Cycloptera tiliaefolia* (p. 462), Amazons; *pavonifolia* (p. 463), Brazil; *falcifolia*, Brazil: *Typophyllum scissifolia* (p. 464), Venezuela; *erosifolia*, Amazons; *truncatifolia* (p. 465), Napo River; *mutilatum*, Ega; *mortuifolia* (p. 466), Upper Amazons.—Additional new genera and new species:—*Meloimorpha* (gen. nov.) *cincticornis* (pp. 468, 469), India: *Gryllacris trinitata* (p. 469), India; *armata* (p. 470), Ceram; *minuscula*, Swan River; *magniceps* (p. 471), India; *longiuscula* (p. 472), Isle of Pines; ? *reducta*, Madagascar; ? *roseivitta* (p. 493), Santarem; ? *parvula*, St. Domingo; *viridescens* (p. 474), Siam: *Penalva* (nov. gen.) *lateralis* (pp. 474, 475), Australia: *Noia* (gen. nov.) *testacea* (pp. 475, 476), India: *Leucica* (gen. nov.) *ferruginea*, South America: *Bauza* (gen. nov.) *nigrifrons* (pp. 476, 477), Loo Choo: *Zulpha* (gen. nov. p. 479), formed to receive *Phaneroptera perlararia*, Westw.: *Molpa* (gen. nov.) *bilineolata* (pp. 479, 480), Ceylon: *Debrona* (gen. nov.) *cervina* (pp. 480, 481), South Africa: *Pemba* (gen. nov.) *armata* (pp. 481, 482), Archidona: *Narea* (gen. nov.) *compacta*, Australia: *Diplophyllum mundus* (p. 483), Rio Janeiro: *Phylloptera subnotata*, Oajaca: *Zedla simplex* (p. 484), India.

Platyphyllum giganteum, Bellevoye (Warion?), Ann. Soc. Ent. Fr. 1870, Bull. p. xl, Isle of Pines (New Caledonia).

Odontura. Frivaldsky describes the following new species of this genus from Hungary:—*O. affinis*, B. E. Z. 1870, p. 42; *brunneri*, l. c. p. 43; *modesta*, l. c.; *speciosa*, l. c. p. 44; *laticauda*, l. c. p. 45; *discoidalis*, l. c.

Deinacrida megacephala, Buller, Zool. s. s. 1867, p. 850, Wellington, New Zealand.

Anabrus stvensonii, Thomas, P. Ac. Philad. 1870, p. 75, and *minutus*, l. c., Colorado.

Thamnotrixon trilineatus, Thomas, l. c. p. 76, Colorado.

Ephippitytha gracilipes, Thomas, l. c. p. 76, Colorado.

ACRYDIIDÆ.

E. BROWN (Ent. M. M. vii. pp. 1-3) remarks upon the occurrence of *Acrydium peregrinum*, Oliv., in various parts of England in October 1869. He had not been able to discover that it had been seen in any other part of Europe; and it was not in any European Catalogue.

F. SMITH (Tr. E. S. 1870, Proc. p. xl) mentions that he had observed *Asilus albiceps* preying upon grasshoppers.

Pachytylus migratorius and *P. cinerascens*. A discussion at the Entomological Society of London is recorded respecting the distinctive characters of these two species, both of which have occurred in Britain (Tr. E. S. 1870, Proc. pp. viii, ix, and xiii).

ANDREOZZI has translated, from a Chinese work on agriculture, notes respecting the ravages of locusts in China, and the superstitions existing among the Chinese with regard to their origin. An extract from this translation is given by STEFANELLI in the Bull. Ent. Ital. 1870, pp. 77-82. From it we learn that records exist of the appearance of locusts in devastating numbers 173 times during a period of 1924 years. The three great causes of famine in China are placed as flood, drought, and locusts. The appearance of the latter were looked upon as direct evidence of Divine wrath, which was sought to be appeased by means of supplication and sacrifice. Later on

another Chinese author asserted that there could be no doubt that locusts were generated from the eggs of crawfish !

WALKER (Cat. Dermap. Saltatoria) characterizes the following new genera and new species as pertaining to this family:—PROSCOPIDÆ: *Proscopia gronosa* (p. 487), Brazil; *inequalis* (p. 488), Brazil; *subobtusata*, Brazil; *expandens*, Brazil; *subvittata* (p. 489), Brazil; *subparallela*, Santarem; *parallela* (p. 490), Para; *sublævis*, Villa Nova; *attenuata* (p. 491), Santarem; *incisa*, Para; *tuberculata*, Archidona; *granulosa* (p. 492), Amazons; *subgranulata*, Columbia.—TRYXALIDÆ: *Tryxalis scitula* (p. 496), Australia; *lativitta*, South Africa. *Pyrgomorpha parabolica* (p. 498), Borneo; *contracta* (p. 499), Philippines; *bispinosa*, South India. *Mesops ensator* (p. 501), Natal; *carinatus*, United States; *filatus* (p. 502), North India. *Legna* (gen. nov.) formed to receive *Locusta crenulatus*, Stoll. *Minorissa* (gen. nov.) *pustulata*, Columbia. *Omurra* (gen. nov.) *congrua* (pp. 503, 504), Amazons. *Parga* (gen. nov.) *spatulata* (pp. 504, 505), South Africa, identified at p. 596 with *Amycus xanthopterus*, Stål. *Moraba* (gen. nov.) *serricornis*, Australia. *Perena* (gen. nov.) *concolor* (p. 506), Corea. *Opomala*? *crassipes* (p. 508), Vera Cruz; *vittata* (p. 509), Amazons; *femoralis*, Para; *basalis* (p. 510), South Africa; *interlineata*, Natal; *convergens* (p. 511), North Bengal; *tarsalis* (p. 512), Silhet; *semipicta*, South India; *galeata* (p. 513), Hong Kong; *inornata* (p. 514), Philippines; *amæna* (p. 515), Australia; *brevitibia*, Australia; *brevicornis* (p. 516), Australia; *picta*, *cingulata* (p. 517), and *serrata*, localities unknown.—TRIGONOPTERYGIDÆ: *Trigonopteryx philippensis* (p. 518), Philippines; *obliqua* (p. 519), Malacca.—XIPHOCERIDÆ: *Xiphocera funesta* (p. 521), Para; *auripennis* (p. 522), Brazil; *basalis*, Para and Demerara; *inclavata* (p. 523), Orizaba; *jucunda*, Venezuela; *spoliata* (p. 524), Brazil; *plagiata*, Bogota; *elegans* (p. 525), British Guiana and Para; *exempta* (p. 527), Australia; *opomaloides*, Port Stephen; *fumosa* (p. 528), Corea; *fumida*, Hong Kong; *adusta*, Swan River.—PAMPHAGIDÆ: *Akicera punctuosa* (p. 532), East Africa; *femoralis*, East Africa. *Pamphagus apicalis* (p. 533), East Africa; *brevis* (p. 534), Natal; *lineosus*, South Africa; *reflexus* (p. 535), South Africa; *sordidus*, South Africa. *Rhomalea picticornis* (p. 538), Mexico; *auricornis*, Mexico.—PHYMATIDÆ: *Phymateus pulchripes* (p. 541), West Africa; *pardalinus*, Fantee; *acutus* (p. 542), West Africa, identified at p. 598 with *squamosus*, Drury. *Petasia laticincta* (p. 544), Congo; *pyrrhomela* (p. 545), South Africa.—ACRIDIDÆ: *Cyrtacanthus inscripta* (p. 550), Jamaica; *pectoralis* (p. 551), St. Domingo; *bispurcata* (p. 552), Guyaquil; *subvittata*, Guyaquil and Demerara; *viridescens* (p. 553), Brazil; *parvula* (p. 554), Demerara; *implete*, West Coast of America; *septentrionalis* (p. 555), West Coast of America; *turbida* (p. 556), Congo; *variegata* (p. 557), Congo; *incluta* (p. 558), Fantee; *fascifera*, Congo; *subselata* (p. 559), South Africa; *decisa* (p. 560), West Africa; *concosa*, East Africa; *flavescens* (p. 561), East Africa; *purpurifera*, South Africa; *pictula* (p. 562), South Africa; *prasina*, Natal; *auricornis* (p. 563), Natal; *fusilinea* (p. 564), Ceylon; *sublitturata* (p. 565), Ceylon; *inficita*, North India; *lutescens* (p. 566), China; *nigrovaria*, Ceram; *fortis* (p. 567), Philippines; *parvula*, New Hebrides; *nana* (p. 568), Sarawak; *ferrina*, Philippines; *irregularis* (p. 569), Australia; *basalis*, Australia; *guttulosa* (p. 570), Australia; *exacta*, Australia; *proxima* (p. 571), North Australia; *approximans* (p. 572), *interrupta*, and *amænula* (p. 573), localities unknown; *pulchella* (p. 574),

India; *notata*, Upper Egypt; *ornatipes* (p. 575), unknown locality; *pictipes*, South Africa. *Acridium piceifrons* (p. 578), Orizaba; *vitticeps* (p. 579), Oajaca; *scutellare*, Mexico; *vicarium* (p. 580), Orizaba; *strenuum*, Oajaca; *varipes* (p. 581), St. Domingo; *tibiale* (p. 582), West Coast of America; *semi-vittatum* (p. 583), Venezuela; *luridescens*, Honduras; *femoralis* (p. 584), Brazil; *melanorhodon*, Santiago; *sellatum* (p. 585), Monte Video; *indecisum*, Cape; *pardalinum* (p. 587), South India; *violascens*, Ceylon; *rubescens* (p. 588), China; *vinosum*, North Bengal; *fumosum* (p. 589), Corea; *tenebrosum* (p. 590), Philippines; *contractum* (p. 591), Philippines; *ceramicum*, Ceram; *transiens* (p. 592), Celebes; *tuberculatum*, Australia; *angustifrons* (p. 593), North Australia; *furciferum*, Australia; *maculicollis* (p. 594), locality unknown.

Akicera informis, Walker, Zool. s. s. 1870, p. 2298, Palestine.

Edipoda latifasciata, Walker, l. c. p. 2299, Palestine; *tricincta*, l. c. p. 2300, Palestine; *terminalis*, Walker, l. c., Mount Sinai; *obscurata*, Walker, l. c., Palestine; *rubescens*, l. c. p. 2301, Palestine; *tincta*, Walker, l. c., Palestine; *variegata*, l. c., Cairo.

Stenobothrus letus, Walker, l. c. p. 2302, Cairo; *limosus*, Walker, l. c., Palestine.

Oxyoryphus venustus, Walker, l. c., Cairo.

Opomala neo-mexicana, Thomas, P. Ac. Philad. 1870, p. 76, New Mexico.

Pezotettix picta, Thomas, l. c. p. 78, Colorado.

Edipoda pruinosa, Thomas, l. c. p. 8, Colorado and New Mexico; *cincta*, l. c., New Mexico; *carliniana*, l. c. p. 81, Colorado; *neglecta*, l. c., New Mexico.

Tomonotus pseudo-nietanus, Thomas, l. c. p. 82, Colorado.

Stauronotus eliotti, Thomas, l. c. p. 82, Colorado.

Boopedon (n. g.) *nigrum*, Thomas, l. c. p. 83, and *flavofasciatum*, l. c. p. 84, Colorado and New Mexico.

RHYNCHOTA

By JOHN SCOTT.

FIEBER, F. X. Dodecas neuer Gattungen und neuer Arten europäischer Hemiptera. Verh. z.-b. Ges. xx. pp. 243-264, Taf. 5 & 6, 1870.

GARBIGLIETTI, ANTONIO. Additamenta et emendationes ad Catalogum Methodicum et Synonymicum Hemipterorum Heteropterorum Italiæ indigenarum. Bull. Ent. Ital. pp. 160-163.

GIGLIOLI, ENRICO HILLYER. Breve cenno sulla distribuzione geografica dell' Emittero Halobates (Esch.). Bull. Ent. Ital. pp. 260, 261.

GREDLER, VINC. Rhynchota Tirolensia. I. Hemiptera heteroptera (Wanzen). Verh. z.-b. Ges. pp. 69-108.

A list of Tyrolese Hemiptera, amongst which he describes one new species.

GRIMM, OS. v. Zur Embryologie von *Phthirus pubis* (mit einer Tafel). Bull. Pét. xiv. pp. 513-517 (1869).

MEYER-DÜR, —. Zwei neue Capsiden nebst Bemerkungen über die Gruppe der grünen *Lygus*-Arten. Mitth. schweiz. ent. Ges. iii. pp. 206-210.

OSCHANIN, B. Hémiptères de Sibérie. Soc. Imp. amat. Sci. nat. Moscou.

[The Recorder has not seen this.]

PACKARD, A. S., JUNR. Certain parasitic Insects. Amer. Nat. vol. iv. pp. 83-99.

An interesting paper, with numerous woodcuts, illustrating both groups of lice in different stages of development, viz. *Pediculi* and *Mallophaga*, and which Packard thinks "should be considered as families of Hemiptera, though degraded and at the base of the Hemipterous series."

RITZEMA, M. De l'origine et du développement du *Periphyllus testudo*. Verh. Akad. Amst. 29 January, 1870. [A work the Recorder has not been able to see.]

For the pith of this paper, showing that *Periphyllus testudo* is only a special larval form of *Aphis aceris*, see Signoret, Ann. Soc. Ent. Fr. (4) x. Bull. p. lxxi.

SCHIÖDTE, J. C. Fortegnelse over de i Danmark levende Tæger. Nat. Tids. vi. (1869) pp. 161-231.

A list, with copious references to authorities, of Danish *Heteroptera*. Two new species of *Nabis* are described in it.

SCOTT, JOHN. Neue europäische Hemiptera. S. E. Z. 1870, pp. 98-101.

——. Zwei neue Arten der Gattung Phymata. L. c. pp. 102-103.

——. On certain British Hemiptera-Homoptera. Ent. M. M. vol. vii. pp. 22-29, 67-75, 118-123, & 146-148.

This paper contains a revision of the families *Delphacidae* and *Cixiidae*, with descriptions of several new species.

SIGNORET, V. Essai sur les Cochenilles ou Gallinsectes (Homoptères—Coccides). Ann. Soc. Ent. Fr. (4) x. pp. 91-110 et 267-286, pls. 6 & 7.

STAL, C. Die amerikanischen Fulgoriden-Gattungen. S. E. Z. 1870, pp. 255-258 & 282-294.

In this paper no less than 40 genera are characterized, many apparently new, though the author gives no key to them. Unfortunately also in no single instance is there any type given;

and the Recorder believes they will ultimately be considered to be of no value (*cf.* Stål, *l. c.* p. 283).

STÅL, C. Enumeratio Hemipterorum. Bidrag till in förteckning öfver alla hittills kända Hemiptera, jemte systematiska meddelanden (Sv. Ak. Handl. Band ix. No. 1), 1870.

TARGIONI-TOZZETTI, A. Sulla *Phylloxera vastatrix* (Planchon). Bull. Ent. Ital. pp. 68-76.

In this paper the author gives the results of his observations, together with drawings of the insect in its various stages of development, as also of the leaves, showing their appearance when attacked. He likewise refers to other authors on the same subject.

THOMSON, C. G. Öfversigt af Sveriges Coriser. Opusc. Ent. i. 2, pp. 26-40.

Twenty-four species are described, six being apparently new.

——. Genus *Jassus*. Ibid. 4, pp. 44-77.

Seventy-two Swedish species are described in twelve sections of this genus.

——. Öfversigt af de i Sverige funna arter af släktet *Lygæus*, Fallén. Ibid. 12, pp. 180-202.

Fifty-seven Swedish species are described, divided into twenty-four sections or subgenera.

——. Öfversigt af de i Sverige funna arter af släktet *Pediopsis*, Burm. *L. c.* iii. 17, pp. 316-321.

Eleven species are described, three as new.

WALKER, FRANCIS. Notes on Aphides. Zool. s. s. vol. iii. (1868) & vol. v. (1870).

The first portion of this paper appears to have been omitted by the Recorder for that year.

——. A list of the Hemiptera collected by J. K. Lord, Esq., in Egypt, along the African shore of the Red Sea and in Arabia; with descriptions of the species new to science. Zool. s. s. pp. 2339-2341, 2378-2381, & 2403-2404 (1870).

BOLD, THOS. J. (Nat. Hist. Trans. Northumberland and Durham, pp. 378-380, vol. iii. 1870), gives an amended list of the Corixæ of the district, increasing the number from 10 to 18 species; also a list of Hemiptera Heteroptera captured by Power at Wallington.

HARDY, JAMES (Proc. Berw. Nat. Club, p. 172, 1870), enumerates several species of Heteroptera and Homoptera captured on the Cheviot Hills.

MEYER-DÜR (Mitth. schw. ent. Ges. iii. p. 209) gives a list of additions to the Swiss fauna.

Myrmecophilous *Hemiptera*. An interesting discussion on this subject is to be found in the "Petites nouvelles," Nos. 12 (1869) & 15, 16, 18 (1870), pp. 53, 62, & 70 respectively. It is also noticed in Ann. Soc. Ent. Fr. x. Bull. p. lxxvi, in a communication by Dr. Signoret from Aug. Rouget.

STAL, in his *Enumeratio Hemipterorum* (Sv. Ak. Handl.), gives the following new genera and species:—

New genera:—

Pantochlora, p. 64, allied to *Piezosternum*; *Embelosterna*, p. 66, allied to *Tesseratoma*; *Asiarcha*, p. 73, allied to *Mattiphys*; *Oxylobus*, p. 75, allied to *Pycnum*; *Candace*, p. 76, allied to *Dalcantha*; *Stenomacra*, p. 97, allied to *Theraneis*; *Iphita*, p. 99, intermediate between *Lohita* and *Physopelta*; *Euscopus*, p. 106, allied to *Ectatops*; *Stictaulax*, p. 107, allied to *Æschines* and *Euscopus*; *Pyrrhopeplus*, p. 115, between *Dindymus* and *Pyrrhocoris*; *Leptophthalmus*, p. 124, allied to *Dysdercus*; *Curtius*, p. 143, allied to *Sagotylus*; *Microphyllia*, p. 167, allied to *Leptoglossus*; *Amblyomia*, p. 171, allied to *Phthia*; *Acidomerla*, p. 182, allied to *Sethenira*; *Apidaurus*, p. 209, allied to *Daclera*; *Stachyocnemus*, p. 215, allied to *Alydus*; *Aufeius*, p. 221, allied to *Harmostes*.

New species:—

Polytes lineosus, p. 8, New Granada; *Trichothyreus vitticeps*, p. 12, New Granada; *Ephynes brevicollis*, p. 16, Brazil; *Acantholoma denticulata*, p. 17, North America; *Rhacognathus americanus*, p. 33, North America; *Ialla rubricosa*, p. 34, Adelaide; *Comperocoris cruciata*, p. 38, Mexico; *Platynopus tagalicus*, p. 39, Philippine Islands; *Canthecona cyanacantha*, p. 42, Fiji; *Glypsus fuscispinus*, p. 47, East Indies; *Podisus (Apatelicus) marginiventris*, p. 49, Mexico; *Podisus (Podisus) punctiger*, p. 52, Columbia; *Podisus (Tylospilus) acutissimus*, Texas; *Stilida sinuata*, p. 61, Australia; *Pantochlora vivida*, p. 65, Campeachy; *Tesseratoma malaya*, p. 67, Malacca; *Mattiphys aurifer*, p. 72, Philippine Islands; *Dinidor rufocinctus*, Bogota; *D. saucius*, p. 79, Rio Janeiro; *D. impicticollis*, p. 80, Bogota; *Astenima stylophthalum*, p. 91, Brazil; *Largus balteatus*, p. 93, Bolivia; *L. varius*, p. 94, Bogota; *L. tristis*, p. 95, Bogota; *Theraneis constricta*, p. 97, Bogota; *Lohita longissima*, p. 98, East Indies; *Iphita limbata*, p. 99, Silhet; *Physopelta biguttata*, p. 100, Manilla; *Ectatops rubens*, p. 105, Manilla; *Euscopus rufipes*, p. 106, Java; *Stictaulax circumsepta*, p. 107, New Guinea; *Dysdercus crucifer*, p. 118, Pulo Loz; *D. insularis*, Fijis; *D. impictiventris*, p. 120, Fijis; *D. sanguinarius*, p. 122, Cuba; *D. rusticus*, p. 123, Bogota; *Phidippus limbatus*, p. 126, Brazil; *Diariptus nigridentis*, p. 128, Brazil; *Molchina granulata*, p. 131, Brazil; *Mozena nigricornis*, p. 135, Cuba; *Quintius dentifer*, p. 139, Bogota; *Nematopus nigroannulatus*, p. 141, Mexico; *Acanthocerus (Camptischium) niger*, p. 145, Brazil; *Machtima mexicana*, p. 147, Vera Cruz; *Zoreva spinifera*, Brazil; *Z. lobulata*, p. 148, Bogota; *Stenoscelidea anescens*, p. 154, Vera Cruz; *Anisoscelis scutellaris*, p. 159, Bogota; *Diactor bogotanus*, p. 160, Bogota; *Leptoglossus macropheylus*, p. 162, Bogota; *L. conspersus*, p. 163, Bogota; *Narnia pallidicornis*, p. 166, Texas; *Leptoscelis pallida*, p. 168, Bolivia; *L. nigripes*, p. 169, Bolivia; *Amblyomia bifasciata*, Mexico; *Spartocera denticulata*, p. 172, Bahia; *S. granulata*, p. 173, *S. lativentris*, p. 174, *S. brevicornis*, p. 175, Monte Video; *Chariesterus gracilicornis*, p. 178, St. Eustache; *Sethenira ferruginea*, p. 182, Cuba; *Acidomeria rustica*, p. 182, Mexico; *A. cincticornis*, Uruguay; *A. nigricornis*, p. 183, *A. cinctipes*, p. 184, *Margus obscurus*, p. 185, Bogota; *Namacus annulicornis*, p. 186, Mexico; *Catorhintha mendica*, p. 187, Texas; *Cimolus obscurus*, p. 189, Texas; *Anasa trilineata*, Bogota; *A. haglundii*, p. 190, Bogota; *A.*

nigricollis, p. 191, Bogota; *A. fusca*, p. 192, Columbia; *A. ruficornis*, Mexico; *A. costalis*, p. 194, Mexico; *A. impictipes*, Mexico; *A. vittiventris*, p. 195, Bogota; *A. discifera*, Bogota; *A. denticulata*, Mexico; *A. acutangula*, p. 196, Cuba; *Cebrenis tuberculata*; Bogota; *C. robusta*, p. 200, Mexico; *Sphictyrtus elatus*, p. 203, Brazil; *Discogaster dentipes*, p. 208, Rio Janeiro; *Apidaurus conspersus*, p. 210, Bogota; *Hyalymenus gracilispinus*, p. 210, Brazil; *Gerris nigricornis*, p. 218, Brazil; *Dasycoris nigricornis*, Mexico; *Ceraleptus americanus*, p. 219, Texas; *Aufeius impressicollis*, p. 222, Texas; *Jadera pyrrhoma*, p. 226, Bogota; *Eusthenes hercules*, p. 231, Silhet?

WHITE (Ent. M. M. vii. p. 52) gives a list of species of this order taken by him in Scotland.

HETEROPTERA.

SCUTATINA.

Odontoscelides.

Corimelæna fulvinervis, sp. n., Scott, S. E. Z. p. 98, Spain.

Pentatomides.

Brachynema triguttata, sp. n., Fieb. Verh. z.-b. Ges. Wien, xx. p. 263, Andalusia.

Strachia placens, amœnula, spp. nn., Walk. Zool. s. s. p. 2340, Mt. Sinai.

SUPERICORNIA.

Stenocephalides.

Stenocephalus agilis, Scop. Taken in Wales by Curzon: Ent. M. M. vii. p. 157.

Pseudophleus dalmanni. Taken in Sweden: Thomson, Op. Ent. iii. p. 340.

Chorosoma punctipes, sp. n., Fieb. Verh. z.-b. Ges. Wien, xx. p. 257, Mecklenburg.

Rhopalides.

Corizus abutilon, Rossi. Occurrence of in Britain recorded by Champion in Ent. M. M. vii. p. 208.

LYGÆODEA.

THOMSON (Opusc. Ent. ii. 12, pp. 180-202) briefly describes the Swedish species of *Lygæus*, enumerating 57 species, of which 5 are treated as new.

The following notes of synonymy are made by this author:—

L. (Nysius) fragariæ (Boh.)=*jacobææ* (Schill.), p. 183; (*Ischnorhynchus*) *didymus* (Fall.)=*resedæ* (Panz.), p. 184; (*Macroplax*) *fuscovenosus* (Dahlb.) and *modestus* (Fall.), var. *b.*=*preysleri* (Fieb.), *ibid.*; (*Acompus*) *bisignatus* (Boh.)=*rufipes* (Wolff), p. 185; (*Plinthisus*) *coleopratus* (Sahlb.)=*pusillus* (Scholtz), p. 186; (*Pterotmetus*) *brachypterus* (Boh.)=*staphylinoides* (Burm.); (*Macrodema*) *gracilis* (Boh.)=*hirsutulus* (Scholtz); (*Pionosomus*) *bimaculatus* (Zett.)=*varius* (Wolff), p. 187; (*Stygnus*) *pedestris* (Fall.)=*sabulosus* (Schill.); (*Tropidostethus*) *spinigerellus* (Boh.)=*holosericeus* (Scholtz), p. 189; (*Megalonotus*) *femoralis* (Boh.)=*prætextatus* (H.-Schf.), p. 190; (*M.*) *insignis* (Boh.)=*pedestris* (Panz.), p. 191; (*Peritrechus*) *sahlbergii* (Fall.)=*luniger* (Schill.); (*P.*) *distinguendus* (Flor.)=*convivus* (Stål), p. 192; (*Plociomeria*)

insectus (Boh.) = *fracticollis* (Schill.), p. 194; (*Gonianotus*) *marginatus* (Dahlb.) = *margineminctatus* (Wolff), p. 195; (*Trapezonotus*) *nigripes* (Fieb. ?) = *anorus* (Flor), p. 198; (*Ischnocoris*) *angustulus* (Boh.), *oculatus* (Flor) = *pallidipennis* (H.-Schr.), p. 202.

Plocionerus luridus, H.-Sch. New to Britain, and redescribed by Saunders in Ent. M. M. vii. p. 156.

Lamproplax sharpi, D. & S., captured by Rye at Wimbledon: *ibid.* p. 157.

Piezoscelis, g. n., Fieb. Verh. z.-b. Ges. Wien, xx. p. 244, Taf. 5. fig. 2. In general form very like *Pterotmetus*, fig. 2*, but it differs from that genus in the form of the anterior thighs and the number of teeth with which these are armed, as also in the 2nd and 3rd joints of the rostrum being of equal length. Sp. *P. antennata* (Sign.).

Stethotropis, g. n., Fieb. l. c. p. 245, Taf. 5. fig. 3. Exceedingly like *Styg-nocoris*. Sp. *S. incana*, sp. n. (Dougl. & Scott), Fieb. *ibid.*, England.

Thaumastopus, g. n., Fieb. l. c. p. 246, Taf. 5. fig. 4. Head longish, 5-sided, shorter than the pronotum; eyes hemispheric, small, placed almost in the middle of the straight side of the head; antennæ long, thin, 1st joint projecting considerably beyond the front of the head and equal to the latter in length; 2nd one-third longer than the 1st, 3rd as long as the 1st, 4th half the length of the 2nd, spindle-shaped; pronotum longish trapeziform, anterior margin straight, without a keel, sides margined, behind the middle slightly concave; scutellum longish, triangular, with a sharp-sided triangular depression at the base and a middle keel, anterior thighs stout, compressed on the sides, widened in the middle on the underside, and with a stout short tooth, from thence to the apex a row of smaller teeth; anterior tibiae slightly bent at the base, on the underside to beyond the middle with a row of small teeth and before the apex a large one; 3rd pair of tarsi not half the length of the tibiae, 1st joint scarcely twice the length of the 2nd and 3rd together. Sp. *T. flavipes*, sp. n., Fieb. l. c. p. 247, Sarepta.

Cymophyes, g. n., Fieb. l. c. p. 247, Taf. 5. fig. 5. Head almost five-sided, more than half the length of the pronotum; eyes hemispheric, their posterior margin resting on the anterior margin of the pronotum, beyond which they project; antennæ stout, cylindrical, about as long as the head, pronotum, and scutellum together; 1st joint reaching to the front of the head, 2nd about twice as long as the 1st, 3rd as long as the 1st, 4th as long as the 2nd; pronotum longish, quadrate, narrowed in front, scutellum triangular, short, equilateral; anterior thighs somewhat compressed on the sides, their lower margin with 5 teeth; anterior tibiae slightly bent at the base; 1st joint of all the tarsi shorter than the 2nd and 3rd together; membrane large, from the tip to the basal angle as long as the outer margin of the corium, with 5 straight entire nerves. Allied to *Artheneis*. Sp. *C. ochroleuca*, sp. n., Fieb. l. c. p. 248, Greece.

New species:—

Lygæus. Thomson, l. c., describes the following new species:—(*Stygnus*) *pilosulus*, p. 188; (*Megalonotus*) *sabulicola*, p. 190; (*Peritrechus*) *puncticeps*, p. 193; (*Drymus*) *hamulatus*, p. 200; (*Scolopostethus*) *melanocerus*, p. 202, all from Sweden.

Notochilus limbatus, Fieb. l. c. p. 257, France.

Lygæus trichopterus, Thoms., Op. Ent. iii. p. 339 (b), Sweden. Allied to *Pionosomus varius*.

Stygnus cimbricus, Gredler, Verh. z.-b. Ges. Wien, p. 84, Tyrol.]

Lygæus leucospilus, Walk. Zool. s. s. p. 2378, Tajura.

Rhyparochromus semidolens, Walk. Zool. s. s. p. 2378, Harkeko.

Micropus discolor, Walk. Zool. s. s. p. 2379, Harkeko.

Cymus cincticornis, Walk. Zool. s. s. p. 2379, Harkeko.

CAPSINA.

Hadrodema pinastri, Fall. Capture of in England recorded by Saunders in Ent. M. M. vii. p. 156.

New genera :—

Perideris, g. n., Fieb. l. c. p. 248, Taf. 5. fig. 6. Allied to *Allodapus*. Sp. *P. marginata*, sp. n., Fieb. l. c. p. 249, Greece.

Zygimus, g. n., Fieb. l. c. p. 249, Taf. 6. fig. 7. Allied to *Lygus* and *Pæcioloscytus*. Sp. *Z. nigriceps* (Fall.).

Plagiorhamma, g. n., Fieb. l. c. p. 250, Taf. 6. fig. 8. Allied to *Ætorhinus*. Sp. *P. suturalis* (H.-Sch.).

Platycranus, g. n., Fieb. l. c. p. 252, Taf. 6. fig. 9. Allied to *Hypsitylus*. Sp. *P. erberi*, sp. n., Fieb. *ibid.*, Montenegro and Dalmatia.

Myrmecophyes (= *Diplacus*, Stål), g. n., Fieb. l. c. p. 253, Taf. 6. fig. 10. Allied to *Labops*. Sp. *M. oschannini*, sp. n., Fieb. *ibid.*, Russia.

Liops, g. n., Fieb. l. c. p. 254, Taf. 6. fig. 11. Allied to *Criocoris*. Sp. *L. puncticollis*, sp. n., Fieb. *ibid.*, Spain.

Stenoparia, g. n., Fieb. l. c. p. 255, Taf. 6. fig. 12. Allied to *Oncotylus* and *Conostethus*. Sp. *S. putoni*, sp. n., Fieb. l. c. p. 256, Spain.

New species :—

Psallus crotchii, Scott, S. E. Z. 1870, p. 99, Spain.

Agalliasstes absinthii, Scott, l. c. p. 100, Martigny.

Lopus satyriscus, Scott, l. c. p. 101, Spain.

Conometopus prasinus, Fieb. l. c. p. 258, Sarepta.

Calocoris hedenborgi, Bosphorus; *C. collaris*, Rhodes and Corfu; *C. beckeri*, Sarepta; *C. lethierryi*, France: Fieb. l. c. pp. 258-260.

Phytocoris nowicki, Fieb. l. c. p. 261, Galicia.

Halticus puncticollis, Fieb. *ibid.*, Montenegro.

Agalliasstes alutacea, Fieb. l. c. p. 262, Madrid.

Macrotylus lutescens, Fieb. *ibid.*, Spain.

Lygus putoni, Mey.-Dür, Mitth. schweiz. ent. Ges. iii. p. 207.

Orthotylus pallidus, Mey.-Dür, l. c. p. 209.

REDUVIINA.

Aphleps, g. n., Fieb. l. c. p. 243, Taf. 5. fig. 1. Eyes as seen from the side spherical-triangular, from above as in *Pirates*; anterior thighs moderately stout, anterior tibia unarmed and gradually thickening to the apex. Head oval, narrowed before the eyes; crown convex; neck very short. Pronotum longish, trapeziform, contracted in the middle, anterior half semicircular, anterior margin keel-shaped with prominent angles; scutellum

long, pointed, with a triangular depression at the base and an acute middle keel; corium base narrow; angular cells of the membrane without projecting nerves. Sp. *A. dimidiata*, sp. n., Fieb. l. c. p. 244, Greece.

New species :—

Nabis argentinus, p. 177, and *N. elongatus*, p. 178, Buenos Ayres, Meyer-Dür, Mitth. schw. ent. Ges. iii.; *N. boops*, *N. hariohus*, Schiödt, Nat. Tids. vi. p. 200, Denmark; *N. siticus*, Wâdy Ferran, *N. discifer*, Dahleck Island, Walk. l. c. p. 2380.

Harpactor signiceps, Walk. l. c. p. 2379, Mount Sinai.

Coranus arenaceus, Walk. l. c. p. 2380, Harkeko, Tajura.

SALDIDÆ.

Salda arenicola, Scholtz, new to Britain: E. Saunders, Ent. M. M. vii. p. 157.

PHYMATIDÆ.

Phymata feredayi, *conspicua*, spp. nn., Scott, S. E. Z. p. 102, New Zealand.

NAUCORIDÆ.

Naucoris minusculus, sp. n., Walk. Zool. s. s. p. 2380, Wâdy Ferran, Tor.

NOTONECTIDÆ.

Thomson (Op. Ent. i. pp. 26–40) records 24 species of *Corisæ* as Swedish, and gives the following synonymy:—*Corisa geoffroyi* (Fieb.) = *C. striata* (Fall.); *C. sahlbergii* (Fieb.) = *C. undulata* (Fall.); *C. striata* (Fieb.) = *C. fossarum*, var. *b* (Fall.), p. 35; *Corisa geoffroyi* (Flor) is renamed *dentipes*; *C. carinata* (Fieb.) is renamed *cavifrons*: Thoms. l. c. pp. 28–39.

Corisa salina, p. 29 (perhaps = *C. panzeri*, Fieb.); *C. castanea*, p. 30; *C. laevis*, p. 31; *C. prominula*, p. 38: spp. nn., Thoms. l. c.

Notonecta nanula, sp. n., Walk. Zool. s. s. p. 2381, Shoobra.

HOMOPTERA.

STRIDULANTIA.

Cicada tamarisci, ♂ & ♀, sp. n., Walk. l. c. p. 2403, Wâdy Ferran.

FULGORIDÆ.

STÅL (S. E. Z. pp. 282–294) publishes a synopsis of American genera belonging to this group.

New genera :—

Rhomicchia, Stål, l. c.; *Copidocephala*, p. 286; *Compsoptera*, p. 287; *Atalanta*, p. 288; *Amantia*, p. 289; *Hypæpa*, *Pæcilostola*, *Coptopola*, *Amycle*, p. 291; *Iomintus*, *Cyrpoptus*, *Curetia*, p. 292; *Pelidnopepla*, *Japetus*, *Learcha*, p. 293; *Scaraks*, *Alphina*, p. 294.

The genital segments of the following species are figured by Scott (Ent. M. M. vii. p. 26):—*Liburnia forcipata* (Boh.), *L. pellucida* (Fab.), and *L. discolor* (Boh.).

Liburnia (Delphax) pallidulus (Marshall, nec Boh.) is renamed *scottii* (Fieb.); and *L. (D.) thoracicus* (Marsh. nec Stål) is renamed *niveimarginata* by Scott, l. c. pp. 67 & 71.

New species :—

Liburnia. Scott (l. c.) describes the following new species:—*L. boldi*, p. 68; *L. capnodes*, *L. signoreti*, p. 69; *L. melanopachys* (Fieb.), *L. fieberi*, p. 70; *L. dalei* and *L. douglasi* (Fieb.), p. 72.

Stiroma affinis (Fieb.), Scott, l. c. p. 73.

Cixius intermedius (Fieb.), Scott, l. c. p. 147, and *C. brachycranus* (Fieb.), Scott, l. c. p. 148.

Delphax dorsalis, Walk. Zool. s. s. p. 2403, Cairo.

Pæcilopectera indicatrix, Walk. l. c. p. 2403, Mount Sinai.

CICADELLINA.

THOMSON (Opusc. Ent. i. pp. 44–77), under the general heading *Jassus*, identifies and gives diagnostic characters of 72 Swedish species.

Jassus porrectus, *J. orichalceus*, and *J. productus*, spp. nn., Thoms. l. c. pp. 56–72.

THOMSON (l. c. iii. pp. 316–321) publishes short descriptions of 11 species of *Pediopsis* (Burn.) found in Sweden, of which 3 are new, viz.:—*Pediopsis brevicauda*, *P. planiscuta*, p. 318; and *P. planicollis*, p. 320. *P. virescens* (Fab.) = *prasinus* (Boh.), Thoms. *ibid.*

Jassus lineolifer, sp. n., Walk. Zool. s. s. p. 2404, Cairo.

Bythoscopus despectus, sp. n., Walk. Zool. s. s. p. 2404, Cairo.

APHIDIDÆ.

WALKER, Zool. s. s. pp. 1048–1053, 1118–1123, 1296–1301, 1328–1333 (1868), 1996–2001 (1870), in this paper gives a translation of Passerini's work, in which the Aphididæ are divided into 6 tribes, and adds notes of his own on many species belonging to the various genera.

Phylloxera vastatrix (Planchon). Targioni-Tozzetti, Bull. Ent. Ital. pp. 68–76, treats at some length on the development and habits of this insect, and illustrates his paper with drawings of the creature in various stages of development. Under the title "Entomologia Agraria," l. c. pp. 202–206, there is a further reference to this genus.

Phylloxera. Lichtenstein (Ann. Soc. Ent. Fr. (4) x. Bull. p. x) gives an account of his observations made during a journey with Planchon to vineyards infested by this insect. He advocates the use of bisulphuret of calcium for their destruction, and believes the insect attacks the healthy vines, a belief which is not shared in by either Signoret or Guérin-Ménéville. See also l. c. pp. xxxvii, l–lii, lx, & lxxiii.

Periphyllus testudo (Van der Hoev.) = *Aphis aceris* (Linn.): Ritzema, Verh. Akad. Amst., January 1871.

COCCIDÆ.

SIGNORET publishes (Ann. Soc. Ent. Fr. (4) x. pp. 91–110, 267–286)

a continuation of his memoir on the insects composing this family, and describes the following new genera and species:—

Targionia, g. n., p. 105. Allied to *Aonidia*. Sp. *T. nigra*, sp. n., Sign. l. c. p. 106.

Planchonia, g. n., p. 282. Allied to *Lecaniodiaspis*, &c.

Mytilaspis ficus, sp. n., p. 94.

SIGNORET, l. c. (Séance 13 April, pp. 27, 28), communicates a paper entitled "Remarques sur quelques recherches entomologiques faites aux environs de Cannes en Mars 1870," in which he mentions certain trees and plants and the species of Coccidæ by which they are infested.

PEDICULINA.

GRIMM (Bull. Péters. t. xiv. pp. 513–517), publishes an interesting paper on the embryology of *Phthirus pubis*, and illustrates its various stages of development, from the time of the egg being deposited to that of the fully developed embryo.

VERMES

BY

E. RAY LANKESTER, B.A.

CHÆTOPODA.

1. CLAPARÈDE, EDOUARD R. Les Annélides Chétopodes du Golfe de Naples. Supplément, accompagné de xiv. Planches. Geneva, 1870.
2. GRUBE, ED. Bemerkungen über Anneliden des Pariser Museums. Arch. f. Nat. 1870, p. 281.
3. LANKESTER, E. RAY. Remarks on *Opalina* and its contractile vesicles, on *Pachydermon* and Annelidan Spermatophors. Q. J. Micr. Sci. x. n. s. p. 143, pl. ix.
4. —. On some migrations of cells. L. c. p. 265.
5. MACINTOSH. On the structure of *Tubifex*. Pr. R. Soc. Edinb. 1869-70, p. 166.
- M. PERRIER. Sur la reproduction scissipare des Naïdines. C. R. 13 June, 1870, p. 1304.
6. HUGO EISIG. Ueber *Nereis hircinicola*, n. sp. Z. wiss. Zool. 1870, p. 103.

CHÆTOGNATHA.

7. KENT, W. SAVILLE. On a new species of *Sagitta* from the South Pacific (*S. tricuspidata*). Ann. N. H. (4) v. 1870, p. 268.

GEPHYREA.

8. BRANDT, ALEXANDER. Anatomisch-histologische Untersuchungen über den *Sipunculus nudus*, L. Mém. Péters. (7) t. xvi. 8.

NEMATOIDEA.

9. BALBIANI, M. G. Recherches sur le développement et le mode de propagation du Strongle géant (*Eustrongylus gigas*, Dies.). J. de l'Anat. et de la Phys. (No. 2, 1870).

10. MARION, M. A. F. Recherches zoologiques et anatomiques sur des Nématoïdes non parasites, marins. Ann. Sci. Nat. (5) t. xiii. 1870.
— . Additions aux recherches, &c. L. c. t. xiv. 1870.
11. ZÜRN, —. Bemerkungen über Trichinen. Arb. d. landwirth. Versuchs-Station in Jena, 1870.
12. METSCHNIKOFF, EL. Remarques sur les Echinodères. Bull. Pét. xiv. 1870, pp. 351–353.
13. HUGO EISIG. Beschreibung einer *Filaria* aus *Halmaturus*.

ACANTHOCEPHALA.

14. SCHNEIDER, ANTON. Entwicklungsgeschichte der Echinorhynchen. SB. d. Oberh. Ges. f. Natur. u. Heilkunde. Giessen, März 1871.

CESTOIDEA.

15. VAN BENEDEN, P. J. Les poissons des côtes de Belgique, leurs parasites et leurs commensaux. 6 planches. Mém. Ac. Roy. Brux. xxxviii. 1870.
16. KNOCH, DR. Nouvelles recherches embryologiques sur le *Bothriocephalus latus*. Bull. Pét. xiv. 1870, p. 176.
17. WILLEMOES-SUHM, RUDOLF VON. Helminthologische Notizen. Z. wiss. Zool. 1870, p. 94.

TREMATOIDEA.

18. METSCHNIKOFF, EL. Recherches embryologiques sur le *Gyrodactylus*. Bull. Pét. xiv. pp. 61–65.
- STIEDA, LUDWIG. Ueber den Bau des *Polystoma integerrimum*. Arch. f. Anat. 1870, p. 675.

HIRUDINIDEA.

19. PHILIPPI, R. A. Ueber *Temnocephala chilensis*. Arch. f. Nat. 1870, p. 35.
20. VAILLANT, L. Contribution à l'étude anatomique du genre *Pontobdelle*. Ann. Sci. Nat. (5) xiii. (68 pp., 3 pls.).

TURBELLARIA.

- HOUGHTON, REV. W. On two species of Land Planariæ from Borneo. Ann. N. H. (4) vi. 1870, p. 255.
21. METSCHNIKOFF, EL. Studien über die Entwicklung der Echinodermen und Nemertinen. Mém. Pét. (7) xiv.

22. VAN BENEDEN, EDOUARD. Etude zoologique et anatomique du genre *Macrostomum*, comprenant la description de deux espèces nouvelles. Bull. Ac. Belg. (2) t. xxx. 1870.

ROTIFERA.

23. CUBITT, CHARLES. Observations on some points in the economy of *Stephanoceros*. M. Micr. J., May 1870, p. 240.
24. HUDSON, C. T. On *Synchaeta mordax*. M. Micr. J. July 1870, p. 26.

INCERTÆ SEDIS.

25. METSCHNIKOFF, ELIAS. Ueber *Tornaria*. Z. wiss. Zool. 1870, p. 131.

1. CLAPARÈDE describes Annelids observed in the winter of 1868-69—some new, others mentioned already in his previous volume. The second part of Ehler's 'Borstenvürmer' having appeared between the publication of the original work and this supplement, the author now avails himself of the opportunity of replying to some criticisms and discussing some views put forward by Ehlers. The book is very rich in anatomical, histological, and physiological details. The remarkable history of *Nereis dumerilii* is given at considerable length, with some additions to the account published in 1869 in the 'Archives Suisses,' and with the addition of four plates in illustration. The facts already published are here reiterated:—(1) that *N. dumerilii* attains sexual maturity; (2) that some specimens of *N. dumerilii* become metamorphosed into *Heteronereis*, and then attain sexual maturity (probably not the same individuals which have developed sexual organs as Nereids, but others born from the eggs of these latter); (3) that there is a second *Heteronereis* form also connected with *N. dumerilii*, which is small and swims on the surface, the first form being large and tubicolous; the two *Heteronereis*-forms develop from the *Nereis*-form apparently at distinct seasons of the year. To these facts M. Claparède now adds that a Nereid *hermaphrodite*-form is also included in the cycle, which, according to observations made by Metschnikow at San Remo, is probably the same as Moquin-Tandon's hermaphrodite *Nereis* from Marseilles (*N. massiliensis*). When to all this is added the fact that the form recognized as *Nereis dumerilii* proper (so to speak) is itself exceedingly variable, the picture of specific indefiniteness is complete. *Nereis cultrifera* and its *Heteronereis* form are also described in this work; but, says M. Claparède, there is no reason to suppose here the existence of sexual maturity in both *Nereis*- and *Heteronereis*-form. All specimens exhibiting ova or spermatozoa were already partially metamorphosed into the *Heteronereis*-form. The discovery that *Heteronereis* is but the sexual condition of species of *Nereis* belongs to M. Malmgren. M. Claparède has shown how complicated the condition of things becomes in some cases by the development of sexual organs in the larvæ (for so the Nereids may be called),

either separated or hermaphrodite, and by the periodic substitution of surface-swimming for areniculous adults.

In pointing out the existence of a simple system of vessels in a species of *Polynoë*, which genus he showed in his former work to be, as a rule, anangian, M. Claparède refers to a work on the histology of *Hermione hystrix* as nearly ready for publication. His death (the greatest loss zoology has suffered for many years) will not, it is believed, prevent its publication.

2. Professor GRUBE took an opportunity last year of spending some weeks in examining the fine collection of Annelids in the Museum of Natural History at Paris, now arranged in agreement with the work of Professor De Quatrefages (*Histoire des Annelées*). He revises many of that author's genera and species, pointing out some which are synonyms, and describing others in greater detail. The following is a list of the Annelids referred to by Professor Grube:—

Genera: *Bluinvillea*, Qf.; *Notocirrus*, Schm.d.; *Plioceras*, Qf.; *Portelia*, Qf.; *Rhytocephalus*, Qf.; *Uncinohæta*, Qf.; *Gymnosoma*, Qf.; *Loxisiphon*, Dies.

Polynoë, Sav.: *lævis*, Aud. et Edw.; *floccosa*, Sav.; *foliosa*, Sav.; *nuda*, Qf. *Eunice*, Cuv.: *tentaculata*, Val.; *botteæ*, Qf.; *pelamidis*, Qf.; *torquata*, Qf.; *laurillardii*, Qf.; *harassii*, Aud. et Edw.; *australis*, Qf.; *rissoi*, Val.; *heterochæta*, Qf.; *ebbranchiata*, Qf.; *scombrinis*, Val.; *gigantea*, Cuv.; *rousseai*, Qf.

Marphysa, Sav.: *sanguinea* (Mont.); *hæmasoma*, Qf.; *peruviana*, Qf.; *gayii*, Qf.

Lysidice, Sav.: *torquata*, Qf.

Blainvillea, Qf.: *filum*, Qf.; *elongata*, Qf.

Lumbriconereis, Bl.: *latreillii*, Aud. et Edw.; *maculata*, Qf.

Euphrosyne, Sav.: *foliosa*, Aud. et Edw.

Nereis, L.: *marionii*, Aud. et Edw.; *crassipes*, Qf.; *bilineata*, Johnst., Qf.; *fulva*, Bl., Qf.; *ventilabrum*, d. Ch., Qf.; *viridis*, Johnst., Qf.; *fucata*, Sav.; *regia*, Qf.; *edenticulata*, Qf.; *nubila*, Sav.; *pelagica*, L.; *bowyerbanckii*, Qf.; *dumerilii*, Aud. et Edw.; *pulsatoria*, Sav., Qf.; *microcera*, Qf.; *sarsii*, Rathke; *yankiana*, Qf.; *heterochæta*, Qf.

Heteronereis, Ersd.: *schmardæ*, Qf.

Lycastis, Sav., Aud. et Edw.: *brevicornis*, Aud. et Edw.

Nephtys, Cuv.: *dussimieri*, Qf.; *bononiensis*, Qf.; *margaritacea*, Johnst.

Glycera, Sav.: *peruviana*, Qf.

Hemipodius, Qf.: *roseus*, Qf.

Scoloplos, Bl.: *elongatus*, Qf.

Petaloproctus, Qf.: *terricola*, Qf.

Clymene, Sav.: *lumbricoides*, Edw.; *zostericola*, Qf.; *uranthus*, Sav.

Johnstonia, Qf.: *clymenoides*, Qf.

Pectinaria, Lam.: *crassa*, Gr.

Terebella, L., Qf.: *emmalina*, Qf.; *gigantea*, Mont.; *elongata*, Qf.; *modesta*, Qf.; *pectoralis*, Qf.; *conchilega*, Qf.; *prudens*, Cuv.; *abbreviata*, Qf.

Phenacia, Qf.: *setosa*, Qf.; *terebelloides*, Qf.

Heterophenacia, Qf.: *gigantea*, Qf.

Heterophyzelia, Qf.: *bosci*, Qf.

Idalia, Sav.: *vermiculus*, Qf.

Distylia, Qf.: *volutacornis* (Mont.); *punctata*, Qf.; *josephineæ* (Riss.).

Spirographis, Viv.: *spallanzanii*, Viv.; *longispira*, Qf.; *elegans*, Qf.; *brevispira*, Qf.

Sabella, Sav., Qf. : *indica*, Sav. ; *magnifica* (Shaw), Qf. ; *bottæi*, Qf. ; *pectoralis*, Qf. ; *armata*, Qf. ; *modesta*, Qf. ; *palmata*, Qf. ; *vesiculosa*, Mont. ; *terebelloides*, Qf. ; *kröyeri*, Qf. ; *arenilega*, Qf. ; *pavonina*, Sav. (*penicillus*, Cuv., *longobranchiata*, Qf.) ; *flabellata*, Sav. ; *cucullus*, Qf. ; *simplex*, Qf. ; *verticillata*, Qf. ; *saxicava*, Qf.

Myzicola, Koch : *modesta*, Qf.

3. RAY LANKESTER points out that the bodies considered by Claparède as parasitic Infusoria, which occur in the spermatie receptacles of the limicolous oligochætous chætopods, and to which the Swiss naturalist gave the name *Pachydermon*, are in reality the sperm-ropes or spermatophors of these worms. In this paper he figures those of *Limnodrilus* and *Nais* ; in a paper published this year (1871) in the same journal, he figures those of two species of *Tubifex*, and enters minutely into their structure and mode of formation. The completely formed spermatophors of *Limnodrilus* and *Tubifex* exhibit very active movement, like that of a ciliated infusorian, due to the coordinate vibration of the filaments of the aggregated spermatozoa.

4. LANKESTER describes the cells of the perivisceral fluid of Chætopodous Annelids as examples of cell-migration. He considers that many are detached from the endothelium of that cavity and then float in the liquid, some being given off from the yellow so-called "hepatic" portion covering the intestine and dorsal vessel, others from the portion which lines the body-wall. He also considers some of the cells in the case of *Tubifex* and *Lumbriculus* to be migrated muscular-fibre cells ; others, again, he shows are the remnants of the generative glands, which appear to undergo a disintegration at some seasons after their activity has reached a certain point.

5. MACINTOSH briefly states the contents of a paper by him as yet unpublished, in which the anatomy of *Tubifex* is to be described in detail. He considers that the corpuscles of the perivisceral fluid do not arise from the yellow glandular cells of the intestine, but are independently originated in the fluid.

6. A species of *Nereis* parasitic on *Hircinia flavescens* is figured and described.

7. KENT describes a new *Sagitta* from specimens preserved in spirit, obtained from Mr. Moore, of the Liverpool Museum. The new species is distinguished by a modification of the so-called "denticles," which assume the form of three very short setæ. Three woodcuts illustrate the paper : anatomical and histological points are not discussed.

8. BRANDT describes the perivisceral fluid of *Sipunculus* as containing red-coloured corpuscles, also very strangely ciliated bodies which might be mistaken for parasites, and which he names "Töpfchen." A special apparatus for erecting the tentacular crown by means of the perivisceral fluid is described. The Töpfchen are beset with cilia, each of which ends in a little knob, and are therefore called by Brandt *ciliæ capitatæ* (*cilia capitata* ?). The so-called "brown tubes," which appear to be glandular organs, are also provided with these very remarkable cilia. The ovaries and the testes are free, and float in the perivisceral fluid. Brandt says they develop from original cells floating in the fluid, but does not say whence these latter come. He remarks that the ripe spermatozoa are in form like those of vertebrates, and are *contractile*. This is a condition similar to what the Recorder has observed in a stage of the development of the spermatozooids of the oligo-

chæmous annelid *Limnodrilus* (Q. J. Micr. Sci. July 1870, and Ann. N. H. February 1871). Brandt's memoir is finely illustrated.

9. BALBIANI finds that the egg of *Strongylus gigas* commences to develop in the uterus of the female, but soon stops, further development occurring after expulsion from the body of the host and in contact with water or moist earth. Five or six months elapse in winter between this period and the appearance of the embryo. The embryo can remain a year at least within the egg without perishing. If pressed out into pure water it is destroyed; it can only live in albuminous fluids: desiccation destroys it. A temporary host, at present unknown, is (the author concludes) occupied by the developing embryo, whence it migrates into its final host.

10. MARION describes, in ninety pages, illustrated with eleven plates, a number of non-parasitic marine Nematoids. Twenty-two supposed new species are described; and a special portion of the work is devoted to anatomical considerations. It is exceedingly remarkable that the author makes no reference whatever to the elaborate papers by Dr. Bastian on the very same subject, published in the Linnean Society's Transactions and the Philosophical Transactions of the Royal Society. French naturalists cannot expect their work to secure respect when they ignore so completely the work of others.

11. ZÜRN investigates the question of the occurrence of *Trichina* as a parasite in insects. He allowed flies to lay their eggs in some trichinized pig's flesh, and after examining 150 of the maggots found no indication whatever of their being affected with *Trichinae*. He suggests that cases of viviparous reproduction, such as that of the *Cecidomyia*-larvæ, may have given rise to the notion that insects are liable to Trichiniasis.

12. METSCHNIKOFF discusses some of the forms described by Greef in a recent paper, which he has also met with in the Mediterranean. He considers that Greef has mistaken the testes of *Echinoderes* for ovaries, and the spermatozoa for embryos. Zürn, of Jena, has recently shown that in the nematoid *Spiroptera circinnata* the converse mistake had been made by Müller, of Vienna, the young embryos of this viviparous form having been taken by him for spermatozooids.

13. The *Filaria* was found in the pericardium of *H. bennettii*. Its anatomy is sketched.

14. SCHNEIDER took the eggs of the *Echinorhynchus gigas* from the pig, fed the larva of *Melolontha vulgaris* with them, and readily succeeded in watching the development of the eggs. With the larva of *Tenebrio molitor* and with *Asellus aquaticus* he did not succeed. He found the embryo of *Echinorhynchus gigas* easier to observe than the species which have been studied by Leuckart and by Greef, because of its larger size. The difficulty of understanding the *Echinorhynchi* lies, he considers, not in a want of knowledge as to them themselves, but in the absence of once-existing intermediate forms. Their structure may be best explained by regarding them as double animals, the proboscis-apparatus being one animal and the sexual apparatus another, whilst the body-wall is common: both units are mouthless. The kind of aggregation seen in the Bryozoa is parallel to this. Such a view of the morphology of the *Echinorhynchi* is favoured by their developmental history, of which Schneider promises shortly a fuller account.

15. VAN BENEDEN (senior) extends his classification of parasites, giving

subdivisions of the two series, "true parasites" and "commensals," which he had previously proposed. He also figures and describes a number of new and little-known cestoid and other parasitic worms found in fish occurring on the Belgian coast.

16. KNOCH replies to a question raised by the French Academy in awarding honourable mention to his work on the Natural History of the Broad Tape-worm (1863), viz. Does the embryo of this worm develop directly into the adult *Bothriocephalus*, or does it undergo other metamorphoses in order to reach this last condition? In spite of the facts contained in Knoch's memoir, Leuckart, Bertolus, and others supposed that fish were intermediary in bringing the worm to man, an hydatid form possibly developing, as in the case of *Tenia* and its *Cysticercus*. Knoch proves, by feeding a young dog, that the *Bothriocephalus latus* develops direct from the ciliated six-hooked embryo. He had previously endeavoured, with negative results, to obtain an hydatid form by feeding fish with the embryos.

17. (a) The development of *Ligula* and *Tricnophorus*, (b) *Tenia malleus*, Goeze, (c) *Distoma caudale* of Rudolphi, are the subjects of these notes.

18. METSCHNIKOFF considers that the formation of the daughter and of the so-called grand-daughter proceeds from the common mass of completely identical embryonal cells, which divide into a peripheral part, which becomes the daughter, and a central part, giving rise to the so-called grand-daughter. He discusses the homologies of various larval Trematoid and Cestoid forms.

19. PHILIPPI, writing from Santiago, describes and figures (not in great detail) the very curious leech, bearing five long tentacles or digitations at its cephalic extremity, to which Blanchard gave the name *Temnocephala chilensis*. Its exact habitat was not previously known. Philippi finds it on the gills and under the tail of the freshwater crustacean *Æglea*.

20. VAILLANT, in about seventy pages and with two plates, gives an account of the viscera of *Pontobdella verrucata*. He does not treat of the histology in detail.

21. METSCHNIKOFF describes various Echinoderm-larvæ, and also the development of the *Pilidium*-larvæ of certain Nemerteans. Up to this time the development of the *Pilidium* from the egg had not been observed. The material on which the author began his work was handed over to him by Kowalewsky when leaving Messina in April 1868. The embryonal development of the Nemerteans observed by Desor, Max Schultze, and Van Beneden did not present the *Pilidium*-stage; and, indeed, the last author, in a paper on "commensalism," mentions the young Nemertean in the *Pilidium*-larva as a case of parasitism. Metschnikoff describes carefully the Nemerteans from which he obtained the eggs the subsequent development of which he studied, but he does not identify them with any known species. The yolk-segmentation in the Nemertean egg was complete, leaving a central segmentation cavity. The first commencement of the formation of the Nemertean body in the *Pilidium* consists in two pairs of inversions of the skin, which form not only the worm but the amnion surrounding it. The cavity arising from the inversions becomes the amnion-cavity. Two median vesicles also form, which later are connected with the lateral vessels of the worm. The germ-stripe (Keimstreif) is represented by the four plates thus formed, and can be separated into an inner and outer layer (Keimblätter):

the outer gives rise to the epidermis and central nervous system; the inner, thinner layer develops the muscular portions. The head and ventral wall are represented by the germ-stripe, formed by the growing together of the four plates, whilst the covering-in of the dorsal region is a secondary formation. The proboscis arises as a simple inversion at the anterior end of the germ-stripe. A peculiar form of *Pilidium*-larva found at Odessa is also described by the author, in which he recognizes a rudimentary nervous system in thickened portions of the epidermis. An important comparison of the development of Echinoderms and Nemerteans follows this, and conclusions as to the affinities of the Echinodermata. Twelve quarto plates illustrate this valuable memoir, of which two belong to the developmental history of the Nemerteans.

22. VAN BENEDEN (junior) describes *Macrostomum viride*, n. sp., from a freshwater ditch at Louvain, and another found among fucoids on the coast of Brittany, to be called *M. clapedii*. The anatomy and histology of the two forms are given with detail and precision, the first-named being figured in a plate, whilst figures of the second are referred to as given in the author's "Recherches sur la composition et la signification de l'œuf," Mém. cour. de l'Acad. Roy. de Belgique, t. xxxiv. Van Beneden is led to erect Ersted's genus *Macrostomum* into a family, *Macrostomiens*, in which he recognizes the following genera and species:—

| | |
|--|------------------------------------|
| <i>Macrostomum</i> , Erst. | { <i>M. histrix</i> , Ersted. |
| | { <i>M. viride</i> , Ed. v. Ben. |
| <i>Omaloostomum</i> , Ed. v. Ben. | { <i>O. schultzei</i> , Clap. |
| | { <i>O. clapedii</i> , Ed. v. Ben. |
| <i>Mecynostomum</i> , Ed. v. Ben. | <i>M. auritum</i> , M. Schultze. |

Some very important facts in support of the author's views on the vitellogogenous glands and their relation to the yolk are described.

23. CUBITT describes with much care the trochal disk in *Stephanoceros* and allied forms. He finds the eye to be double, and not single as stated by some authorities. He also finds branched nerve-cells in the so-called brain. He announces new views as to the contractile power of the water-vascular system, and declines to admit the existence of a cilium producing the "flickering appearance" in the vibratile tag, as described by Huxley in *Lacinularia*. Other observations, evidently made with care, and therefore worthy of attention, are recorded in this paper.

24. HUDSON gives a similar essay on the structure of *Synchaeta*.

25. *Tornaria* was first described by Johannes Müller; it has since been seen by Krohn, Fritz Müller, and Alex. Agassiz. Metschnikoff describes and figures it carefully. He points out its possible affinities, and concludes that, if it is not the larva of *Balanoglossus*, it is, at any rate, very much like that strange worm.

ECHINODERMATA

BY

RAMSAY H. TRAQUAIR, M.D.

CARPENTER, W. B. On the reparation of the spines of Echinida. *M. Micr. J.* May 1870, pp. 225-228.

HERCLOTS, J. A. Echinodermes peintes d'après Nature, par les soins de Kuhl, Van Hasselt, et Sal. Müller, Membres de la commission pour l'exploration physique des possessions d'outre mer des Pays-bas : publiés d'après les cartons du Musée Royal d'histoire naturelle à Leide. *Bijdragen tot de Dierkunde uitgegeven door het Genootschap Natura Artis Magistra te Amsterdam.* Amsterdam, 1869.

Contains 9 beautiful plates, with descriptions of Echinoderms from the Dutch East-Indian possessions, from drawings made on the spot.

MARTENS, E. von. Die Ophiuriden des Indischen Oceans. *Arch. f. Nat.* 1870, p. 245.

METZGER, A. Die wirbellosen Meeresthiere der ostfriesischen Küste; ein Beitrag zur Fauna der deutschen Nordsee. *JB. Ges. Hannov.* 1869-70.

OWSJANNIKOW, PH. Ueber des Nervensystem der Seesterne. *Bull. Pétersb.* Nov. 1870, pp. 310-318.

PHILIPPI, R. A. Neue Seesterne aus Chile. *Arch. f. Nat.* 1870, p. 268.

TROSCHEL, Prof. Ueber die Pedicellarien der Echinodermen. *Verh. Ver. Rheinl.* 1870, pp. 137, 138.

PERRIER, E. Recherches sur les Pédicellaires et les Ambulacres des Astéries et des Oursins. Pt. I., *Ann. Sc. Nat.* t. xii. pp. 197-304 (1869); Pt. II., *ibid.* t. xiii. pp. 1-81 (1870).

This paper comprises, besides most elaborate descriptions of the pedicellariæ and ambulacral tubes of the species of Asterids and Echinids in the Paris Museum of Natural History, descriptions of many new starfishes in the same collection. The author makes no allusion to Stewart's paper "On the spicula of the Regular Echinoidea" (see *Zool. Rec.* vi. p. 614).

——. Pédicellaires et Ambulacres des Echinoneus. *Ann. Sc. Nat.* t. xiv. 1870, art. no. 8.

- PERRIER, E. Observations sur les relations qui existent entre les dispositions des Pores Ambulacraires à l'extérieur et à l'intérieur du test des Echinides réguliers. N. Arch. Mus. t. v. 1869, pp. 207-228.
- VERRILL, A. E. Contributions to Zoology from the Museum of Yale College.—No. 5. Description of Echinoderms and Corals from the Gulf of California. Am. J. Sc. vol. xlix. 1870, pp. 93-100.
- . On the generic relations and synonymy of the common Sea-urchin of New England (*Euryechinus drobachiensis*, Verrill). Am. J. Sc. vol. xlix. 1870, pp. 101-103.

Geographical Distribution.

'Porcupine' Expedition of 1869.—CARPENTER, JEFFREYS, and WYVILLE THOMSON record the occurrence of the following species in the area dredged (extending from the west of Ireland to Rockall Bank, the Færoes, and Shetland):—*Cidaris papillata*, *Echinus elegans*, *Spatangus raschi*, *Brisina endecacnemos*, off the west of Ireland; *Pourtaleisia miranda*, S.E. from Rockall; *Ophiocten krøyeri*, *Ophiothrix fragilis*, *Amphiura balli*, *Ophiacantha spinulosa*, off the S.W. extremity of Ireland; *Asteronox loveni*, N.W. of Hebrides and in the Minch. The "cold area" was found to be extraordinarily rich in Echinoderms, mostly of a decidedly boreal or even arctic character (e.g. *Antedon eschrichti*), while many of the southern types which presented themselves were much reduced in size.

Various Echinoderms are also recorded by the same authors (P. R. Soc. Dec. 8, 1870) as taken in the 'Porcupine' Expedition of 1870, off the French, Spanish, and Portuguese coasts, and in the Mediterranean.

METZGER (l. c.) records the following Echinodermata from the East-Frisian coast, the investigation of which, owing to its topographical peculiarities, is accompanied with very considerable difficulties:—

Asteracanthion rubens, M. & T.; *Solaster papposa*, Forbes; *Ophiura texturata*, Lmk.; *Amphiura neglecta*, Forbes; *Ophiothrix fragilis*, Müll.; *Spatangus purpureus*, Müll.; *Echinocardium cordatum*, Penn.; *Echinocyamus pusillus*, Müll.; *Psammechinus miliaris*, Leske; *Sphærechinus esculentus*, L.

CRINOIDEA.

Comatula (Actinometra) hamata, sp. n., Cape Bantam: Kuhl and Van Hasselt, Bijd. tot de Dierk. 1869, p. 10.

Pentacrinus wyville-thomsoni, sp. n., Jeffreys, P. R. Soc. Dec. 1870, p. 157, off the coast of Portugal, in 1095 fathoms.

OPHIUROIDEA.

VON MARTENS (Arch. f. Nat. pp. 245-260) gives a list of 63 species from the Indian Ocean, from East Africa to the Polynesian Islands. Twenty-four species were found by the author himself in the Indian archipelago; and of these the following are new:—

Ophiactis maculosa, South Chinese Sea, between Singapore and Bangkok; *Ophiomyxa brevispina*, Amboina; *Ophiocoma ternispina*, Larentuka, Isl.

Flores; *Ophiothrix punctokimbata*, Java; *Ophiothrix rotata*, Zamboanga, Mindanao; *Ophiothrix cataphracta*, Singapore; *Ophiothrix triloba*, Red Sea.

Ophiothrix serrata, sp. n., Kuhl & van Hasselt, sp., described by Herclots (*l. c.* p. 9), Cape Bantam.

ASTEROIDEA.

OWSJANNIKOW's researches on the nervous system of Starfishes (Bull. Pét. pp. 310-318) were made on *Asteracanthion rubens*, *tenuispinus*, *glacialis*, *Astropecten glacialis*, and others. The nervous ring is a flat band, containing no swellings or ganglia, and not different in structure from the ambulacral nerves, which latter possess nerve-cells as well as fibres. The ambulacral nerve forms a demicanal, the fine membrane closing the canal above (dorsally) containing cells and fibres which the author does not consider to appertain to the nervous system. The general rule that, in the lower forms of animal life, the nerve-elements are of considerable size, does not hold here, as the cells are small and the fibres fine.

PERRIER (Ann. Sc. Nat. xii. p. 197) shows that the Asteroidea with four rows of ambulacra in each groove (*Asteracanthion*, *Heliasaster*) are also very different as regards their pedicellariæ from those with only two rows. In the first group there are two forms of pedicellariæ, the *straight* and the *overlapping*: both possess two jaws and a basilar piece; but in the decussating form (*pedicellaires croisées*) the jaws cross each other below like the two blades of a pair of scissors. In the second group, including the greater number of Starfishes, the basilar piece is gone, and the pedicellaria is sessile on the body of the Starfish. Here there are also two forms of these organs, *valvular* and *pincer-shaped*. Pedicellariæ are absent in the genera *Solaster*, *Chetaster* (?), *Ophidiaster*, *Scytaster*, *Astropecten*, and *Echinaster*.

The following new species in the Paris Museum, some of which were previously named by Valenciennes, are described by Perrier (*l. c.* pp. 243-298):—

Asteracanthion lacazii (= *Echinaster echinura*, Val.), South Carolina; *Echinaster clouei*, Val., *E. affinis*, North of India; *E. ornatus*, Cape of Good Hope; *Ophidiaster attenuatus*, Zanzibar; *O. irregularis*, Mayotte; *O. purpureus*, allied to *O. cylindricus*, Seychelles; *Ophidiaster* (?) *vestitus* (perhaps an *Echinaster*), Mayotte; *Scytaster indicus*, India; *Culcita arenosa*, Val., Sandwich Islands; *C. pulverulenta*, Val., Le Sonde; *Oreaster clouei*, Diego Jouarès; *O. mammosa*, Val., Zanzibar; *Astrogonium emilii*, locality unknown; *A. dubium* (?) (perhaps a variety of *A. cuspidatum*, Müll. & Trosch.), locality unknown; *Gonioliscus articulatus*, Seychelles; *G. acutus*, New Holland; *G. michelini*, Mazatlan; *Asteriscus pulchellus*, Val., Messina; *A. calcaratus*, Val., Valparaiso; *A. exiguus*, Val., New Holland; *A. wega*, Val., locality unknown; *Astropecten perarmatus*, South Seas; *A. samoensis*, Samoa; *A. mülleri*, Val., Copenhagen; *A. myosurus*, Val., Mediterranean.

The following are described by Philippi (Arch. f. Nat. pp. 268-274) from the Chilian seas:—

Gonioliscus penicillatus, *Asteracanthion clavatum*, *A. fulvum*, *A. spectabile*, *A. mite*, *A. varium*, *A. fulgens*.

Calveria hystrix, gen. et sp. n., Carp., Jeff., and Thomson (Pr. R. Soc. Nov. 18, 1869, p. 445), Shetland*.

* In the Report of the Expedition of 1870 this name is given as the one to be applied to the singular new soft urchin referred to under Echinoidea.

ECHINOIDEA.

Reparation of broken spines.—Carpenter (M. Micr. J. p. 225) gives up the idea that the reparation of broken spines in Sea-urchins is effected by any "investing membrane" of the spine. The restorative power he considers to reside in the protoplasmic matrix filling up the interspaces of the calcareous network of the spine; and the continuity of the new growth with the outer layer of the stump, and its apparent derivation therefrom, while it is abruptly marked off from the central part, he accounts for by supposing that this "sarcodic basis substance" may after a time cease to occupy the older and inner portions of the spine, and become restricted to the newer and outer.

Pedicellariæ and Ambulacra.—A very minute description of these organs in the Echinoidea is given by Perrier, Ann. Sc. Nat. xii. p. 197. As regards the Irregular Urchins, he had, at the time this paper was published, not detected calcareous terminal rosettes on the ambulacra of any of the genera, while he had found pedicellariæ only in the Spatangoids. Most specimens of Irregular Urchins, as they occur in museums, have their external appendages pretty well rubbed off. However, in a subsequent short paper (l. c. t. xiv. 1870), M. Perrier states that he has found calcareous rosettes on the ambulacra of *Echinoneus*, and mentions also two different forms of pedicellariæ from the same genus.

The same author (N. Arch. Mus. v. p. 226), after carefully examining the disposition of the ambulacral pores of the regular echinids, gives the following classification of the group, embodying also his previous researches on their pedicellariæ and ambulacral tubes:—

Regular or Endocyclical Urchins.

Openings of the intestinal canal situated at the two poles of the test. Anus surrounded by genital and ocular plates. Ambulacra not petaloid; ambulacral tubes terminated by a flattened disk, which is supported by a calcareous rosette of from four to six pieces serrated at their outer margins, and united by a calcareous framework surrounding the central orifice.

I.—Test circular. Pedicellariæ of three pieces.

A.—Ambulacral arææ narrow, each semiarea containing only a double line of pores, more or less flexuous. Pedicellaria-head directly fixed to a solid prolongation of the stem. Spicules of the ambulacral tubes spindle-shaped, or forming arcs of circles roughened with spines. Tubercles of the test crenulated and perforated.

Genera: *Cidaris*, *Leiocidaris*, *Goniocidaris*.

B.—Ambulacral arææ large; each ambulacral plate presenting from 7 to 9 pairs of pores disposed in a double flexuous line in the upper and middle regions of the test, but accumulated without order near the peristome. Pedicellaria of the ophiocephalous type, not directly fixed to the stem. Spicules of the ambulacral tubes spindle-shaped. Tubercles of the test not crenulated or perforated:—" *Echinocidariens*."

Genus *Echinocidaris*.

C.—Ambulacral arææ broad. Pores disposed in more or less oblique transverse bands of 3 pairs. Pedicellariæ not directly fixed to the stem, and belonging to the tridactyle type. Spicules of the ambulacral tubes irregularly branched or in the form of irregularly perforated plates, along with which may occur some simple arcuate spicules. Tubercles of the test crenulated and perforated:—" *Diademiens*."

Genera: *Diadema*, *Savignya*, *Asteropyga*.

D.—Ambulacral arææ broad. Pedicellariæ of four different forms—gemmiform, tridactyle, ophiocephalous or buccal, and trifoliate (the last form absent perhaps in some genera)—and never directly fixed to the stem. Spicules of the ambulacral tubes arcuate, with the extremities curved downwards, simple or surmounted with a hook at each of the lateral curvatures.

1. Pores disposed in transverse ranges of three pairs.

a. Impressions around the ambulacral and interambulacral plates; pores at the angles of these plates. Tubercles sometimes crenulated, never perforated :—" *Salmaciens*."

Genera : *Temnopleurus*, *Salmacis*, *Microcyphus*, *Mespilia*.

β. Neither impressions nor pores at the circumference of the plates. Tubercles neither crenulated or perforated :—" *Echiniens*."

Genera : *Amblypneustes*, *Echinus*, *Sphærechinus*, *Psammechinus*, *Boletia*.

2. Pores disposed in more or less curved ranges containing 5 or 6 pairs :—" *Loxechiniens*."

Genera : *Toxopneustes*, *Loxechinus*.

3. Pores forming in each ambulacral demiarea two regular lateral bands, between which are found, sometimes an irregular median line, sometimes an unlimited number of sporadic pores :—" *Tri-pneustiens*."

Genera : *Tri-pneustes*, *Holopneustes*.

E.—General characters of group D; but the spicules of the ambulacral tubes have the form of perforated plates :—" *Heliocidariens*."

Genus *Heliocidaris*.

II.—Test elliptical. Pedicellariæ of the tridactyle, ophiocephalous, and gemmiform types, the latter having the jaws terminated by unsymmetrical hooks. Pores disposed in ranges of four pairs at least, this number of pairs increasing towards the summit of the test. Spicules of the ambulacral tubes simple, arcuate, recurved downwards at their extremities :—" *Echinométriens*."

Genera : *Echinometra*, *Acrocladia*, *Podophora*.

Verrill (Am. J. Sc. vol. xlix. p. 101) maintains the validity of his generic name *Euryechinus* for *E. drobachiensis* and *E. lividus*, the name *Toxopneustes* having been originally applied by Agassiz in 1841 to urchins of a different generic type. *Toxocidaris*, A. Agassiz, 1862, he considers also synonymous with *Toxopneustes*, Agass. 1841.

Carpenter, Jeffreys, and W. Thomson mention (P. R. Soc. Nov. 18, 1869, p. 450) an Echinid allied to *Astropyga*, but with a flexible test, taken N. W. of the Hebrides. The same naturalists found it again off the coast of Spain (ib. Dec. 8, 1870, p. 154).

Clypeaster speciosus, sp. n., Verrill (l. c. p. 95), La Paz.

Encope californica, sp. n., Verrill (l. c. p. 97), La Paz.

HOLOTHUROIDEA.

Synapta fasciata, sp. n., Kuhl et Van Hasselt, Bijd. tot de Dierk. 1869, p. 2, West coast of Java.

Holothuria maculata, sp. n., Kuhl et Van Hasselt (l. c. p. 2), west coast of Java.

CŒLENTERATA

BY

RAMSAY H. TRAQUAIR, M.D.

-
- ALLMAN, G. J. The genetic succession of Zooids in the Hydroidea. Tr. R. Soc. Edinb. xxvi. pt. 1, 1870, pp. 97-106.
- BOECK, A. Om to tilsyneladende bilateral-symmetriske Hydro-meduser: *Dipleurosoma typica* og *stuitzii*. Vid. Medd. 1866, pp. 131-140.
- BRANDT, ALEX. Ueber *Rhizostoma cuvieri*. Ein Beitrag zur Morphologie der vielmündigen Medusen. Mém. Péters. 1870.
- DUCHASSAING (de Fontbressin), P. Revue des Zoophytes et des Spongiaires des Antilles. 8vo. Paris: 1870.
- DUNCAN, P. M. On the Madreporaria dredged up in the Expedition of H.M.S. 'Porcupine.' P. R. Soc. 1870, xviii. pp. 289-301; Ann. N. H. (4) v. pp. 286-298.
- GRAY, J. E. Notes on some new genera and species of Alcyonoid Corals in the British Museum. Ann. N. H. (4) v. pp. 405-408.
- . Catalogue of Lithophytes or Stony Corals in the Collection of the British Museum. 8vo. London: 1870.
- GREEFF, R. *Protohydra leuckarti*, eine marine Stammform der Cœlenteraten. Z. wiss. Zool. 1870, i. pp. 37-54.
- KENT, W. S. On a new genus of the Madreporaria, or Stony Corals (*Stenohelia*). Ann. N. H. (4) Feb. 1870, pp. 120-123.
- . On the calcareous spicules of the Gorgoniaceæ: their modification of form, and the importance of their characters as a basis for generic and specific diagnosis. M. Micr. J. Feb. 1870, pp. 76-94.

KENT, W. S. On two new genera of Alcyonoid Corals taken in the recent expedition of the yacht 'Norna' off the coasts of Spain and Portugal. Qu. J. Micr. Sc. Oct. 1870, pp. 397-399.

——. On an existing Coral, closely allied to the Palæozoic genus *Favosites*; with remarks on the affinities of the Tabulata. Ann. N. H. (4) vi. pp. 384-387.

——. Observations on the Madreporaria, or Stony Corals, taken in the late expedition of the yacht 'Norna' off the coasts of Spain and Portugal. Ann. N. H. (4) vi. pp. 459-461.

KÖLLIKER, A. Anatomisch-systematische Beschreibung der Alcyonarien. Erste Abtheilung. Die Pennatuliden. Abh. senck. Ges. vii. 1870, pp. 487-602.

A continuation of the valuable memoir the first part of which has been already noticed in Zool. Rec. vi. pp. 652 and 660. It is illustrated by seven additional plates, and contains anatomical and systematic descriptions of the following genera and their species:—*Hakseptrum*, *Virgularia*, *Stylatula*, *Acanthoptilum*, *Pavonaria*, *Scytalium*, *Funiculina*, and *Hakipteria*.

METSCHNIKOFF, E. Ueber die Entwicklung einiger Cœlenteraten. Bull. Péters. xv. 1870, pp. 95-100.

POUCHET, G., & MYÈVRE, A. Contribution à l'Anatomie des Alcyonaires. J. de l'Anat. 1870.

Contains a minute description of the anatomy of *Alcyonium digitatum* and *palmatum*. Some of the points contained in this paper have been already published in C. R. t. lxi. pp. 1097-1099 (Zool. Rec. vi. p. 652).

SCHNEIDER, A. Zur Entwicklungsgeschichte der *Aurelia aurita*. Arch. mikr. Anat. vi. pp. 363-368.

SPAGNOLINI, A. Catalogo degli Acalefi del golfo di Napoli. Atti Soc. Ital. xii. Feb. 1870, pp. 607-648.

Contains the descriptions and synonymy of 25 species of Mediterranean Siphonophora, 18 of which are recorded from the Bay of Naples, the remaining 7 being from Nice, Messina, and Villafranca.

STUART, ALEX. Ueber die Entwicklung der Medusenbrut von *Velella*. Arch. Anat. Phys. 1870, pp. 366-373.

VERRILL, A. E. Notes on Radiata. No. 6. Review of the Corals and Polypes of the West Coast of America. Tr. Conn. Ac. i. pp. 503-558.

Continued from the parts published in the preceding year, for which see

Zool. Rec. vi. p. 653. In the "Addenda" additional species of Pennatulidæ and Gorgoniidæ are given.

VERRILL, A. E. Notes on Radiata.—No. 7. On the Geographical Distribution of the Polypes of the West Coast of America. Tr. Conn. Ac. i. pp. 558-567.

———. Synopsis of the Polypes and Corals of the North-Pacific Exploring Expedition, under Commodore C. Ringgold and Capt. J. Rogers, U.S.N., from 1853-1856, collected by Dr. Wm. Stimpson, Naturalist to the Expedition. Pt. IV. Actinaria. P. Ess. Inst. vi. pt. 1, pp. 51, 1868-1870.

This synopsis is continued from vol. v. p. 330, of the same 'Proceedings,' for which see Zool. Rec. v. p. 568. In the present part the Actinaria are finished, whereon follow additions and corrections to the Alcyonaria and Madreporaria; lastly, a geographical list is given of the species enunciated in the synopsis.

———. Contributions to Zoology from the Museum of Yale College.—No. 5. Descriptions of Echinoderms and Corals from the Gulf of California. Am. J. Sc. xlix. pp. 93-100.

———. Contributions to Zoology from the Museum of Yale College.—No. 7. Descriptions of new Corals. Am. J. Sc. xlix. pp. 370-375.

HYDROZOA.

HYDROIDA.

ALLMAN, Trans. R. Soc. Edinb. xxvi. pp. 97-106, gives, by means of brief formulæ, some very clear illustrations of the law of the genetic succession of zooids in the Hydroida, from the simplest to the most complex phases of polymorphism in this class. He draws also some interesting comparisons between the arrangement of generative zooids in many Hydrozoa and several forms of inflorescence in plants.

METSCHNIKOFF (Bull. Pét. xv. pp. 95-100) observed the development of the ova of an *Oceania* (allied to *O. flavidula*, Gyl.), and of a *Tiara* (related to *T. smaragdina*, Hæck.) into planulæ and polype-stocks. *Cunina* (*Ægineta*) *flavescens* and *Æginopsis mediterranea* were observed directly developed from eggs. In *Carmarina hastata*, the youngest form described by Hæckel was also seen to be developed directly from the egg. In *Cunina rhododactyla* the buds, some found already loose in the stomach, others developed from the back of the parent, formed medusids agreeing so with the adult, in their marginal vesicles and tentacles, that there is here no dimorphism of the two generations.

GREEFF has described (Z. wiss. Zool. 1870, p. 37) a hydroid polype, resembling in the principal points of its structure the ordinary freshwater 1870. [VOL. VII.] 2 K

Hydra, but being entirely destitute of tentacles. The body consists of two well-marked layers, outer and inner; the outer has no pigment, but contains large thread-cells. The author, however, could not detect any epithelial layer lining the cavity of the body, nor did he find cilia in any part. No sexual reproduction or sexual form was observed; but the polyp reproduced itself freely by division. To this form Greeff applies the name of *Protohydra leuckarti*, and looks on it as one of the oldest surviving stock-forms of the Cœlenterata, and especially of the Hydroid type. *Hab.* Ostend, among diatoms and algæ.

METZGER (JB. Ges. Hann. 1869-70) gives the following list from the East-Frisian coast:—

Mesonema henleana, Köll.; *Callirhoe basteriana*, Péron; *Thaumantias hemisphærica*, Péron; *Tubularia coronata*, Van Beneden; *T. dumortierii*, Van Ben.; *Syncoryne pusilla*, Gaert.; *Hydractinia echinata*, Van Ben.; *Campanularia gelatinosa*, Lmk.; *C. geniculata*, Lmk.; *Clythia volubilis*, Lmk.; *Sertularia cupressina*, L.; *S. operculata*, L.; *Thoa halecina*, L.; *Dynamena pumila*, L.; *Plumularia falcata*, L.; *P. pinnata*, L.; *P. cristata*, Lmk.

Dipleurosoma, g. n., Boeck (*l. c.*). Remarkable for its striking bilateral symmetry. *D. typica*, sp. n., south-western coast of Norway. *D. stuvitzi*, sp. n., Newfoundland.

SIPHONOPHORA.

METSCHNIKOFF contributes (*l. c.*) some notes on the development of *Galeolaria aurantiaca*, *Halistemma rubrum* (*Agalma rubrum*, Vogt), *Halistemma*, sp., *Agalma punctatum*, and *Physophora hydrostatica*.

STUART (Arch. Anat. Phys. 1870, p. 366) gives an account of the development of the medusa-buds in *Veella spirans*. He believes that *Chrysomitra spirans* = medusid of *Veella*.

DISCOPHORA.

SCHNEIDER (Arch. mikr. Anat. vi. p. 363) describes the structure of the scyphistome and strobile forms of *Aurelia aurita*, obtained on Zostera-leaves from Kiel in Feb. 1869. According to those researches the author holds it now proved that *Scyphistoma* does not represent the Hydroid, but the Medusoid form of the Cœlenterata.

HINCKS points out that the observations communicated by Mr. McAndrew to Dr. Gray, and published in the Annals of Nat. Hist. for Oct. 1869, of Sea-jellies (*Medusa æquorea*, Forskål) having been seen lying on their backs at the bottom of the clear waters of the Red Sea, with their tentacles expanded like a flower, had long ago been made by Mertens, who, as quoted by Agassiz, had constantly found *Medusa (Polyclonia) mertensii* in the lagoons of Ualau, "with their arms spread and turned upwards." Note on the habits of the Discophora, Ann. N. H. (4) v. p. 145.

BRANDT (Mém. Pét. 1870) describes with great minuteness the gastrovascular system of *Rhizostoma cuvieri*. He points out a certain amount of bilateral symmetry in the body of *Rhizostoma*, and found also in young individuals, from 8 to 20 centims. high, the remains of the original central mouth. He rejects the idea that these animals are in any sense to be considered colonies, agreeing with Fritz Müller that we may often see a similar, though temporary, polystony in Hydroid Medusæ, when the edges

of a many-folded oral lobe here and there come into contact with each other.

Cyanea capillata, Esch., *Rhizostoma cuvieri*, Lmk., *Chrysaora hyoscella*, Esch., *Aurelia aurita*, Lmk., *Aurelia cruciata*, L., recorded by Metzger from the East-Frisian coast. JB. Ges. Hann. 1869-70.

CTENOPHORA.

Cyditpe pileus, Esch., *C. pomiformis*, Patterson, *Beroe ovatus*, Baster, recorded by Metzger (*l. c.*) from the East-Frisian coast.

ACTINOZOA.

Geographical Distribution.

VERRILL (Tr. Conn. Ac. i. p. 503) gives a table of the geographical distribution of the Polyps of the West Coast of America, arranged according to the same provinces or topographical regions as those already used by the same author in the case of the Echinodermata. 1. The *Arctic* province has yielded 4 species, also found on the Atlantic coasts of America and Europe. 2. The *Sitchian* [!] prov. 2 sp. 3. The *Oregonian* prov. 7 sp., of which 3 are peculiar to it. 4. The *Californian* prov. 8 sp., of which 5 are peculiar to it, the other 3 occurring also in the Oregonian. 5. The *Panamanian* [!] prov., the richest of all, has yielded 116 sp., of which 104 are peculiar to it: this region is subdivisible into 3 subprovinces,—A. *Mexican*, containing 42 sp., of which 20 are peculiar, 16 in the Panamanian (proper), and 6 are common to all three subdivisions; B. *Panamanian* (proper), containing 80 sp., of which 51 are peculiar, 16 occur also in the Mexican subprovince, and 7 in the Ecuadorian; C. *Ecuadorian*, comprising 17 sp., of which 4 are peculiar, 7 are common to it with the Panamanian, and 6 are found in all three. 6. The *Peruvian* prov. has yielded 15 sp., all peculiar to it but one (*Bunodes papillosa*). 7. The *Chilian* prov. 11 sp., all peculiar to it but the above-cited *B. papillosa*, common to it with the Peruvian. 8. The *Fuegian*, 6 sp., all peculiar to the province. The Panamanian province is very rich in Madreporaria and Alcyoniaria. There are no Madreporaria recorded from the Arctic or Sitchian provinces; but 2 (*Balanophyllia elegans*, Verr., and *Allopora venusta*, Verr.) occur in the Oregonian; one *Astrungia* is recorded from the Straits of Magellan.

DUCHASSAING (*l. c.* p. 8) asserts that the types of Actinozoa dominant in the Caribbean Sea are *Zoantharia malacodermata*, *Astræidæ*, and especially *Gorgonidæ*, but that the fauna of this sea is distinguished by a characteristic and almost complete absence of *Stylinaceæ* and *Fungidæ*.

Only *Alcyonium digitatum*, L., *Pennatula phosphorea*, L., *Actinoloba dianthus*, Sægartia viduata, Müll., and *Tealia crassicornis*, Müll., occur in Metzger's list of Actinozoa from the East-Frisian coast. JB. Ges. Hann. 1869-70.

ALCYONIARIA.

Alcyoniidæ.

Gymnosarca, g. n., Kent (Q. J. Micr. Sc. x. p. 397). Corallum firm, smooth, attached by its base and partially incrusting, throwing off free cylindrical stolons which occasionally branch and coalesce. Polype-cells elevated, cylindrical. Animals semiretractile. *G. bathybius*, Cezimbra, Portugal.

*Cereopsis**, g. n. (Kent, *ibid.* p. 398). Corallum clavate, base slightly expanded; stem barren below, slightly lobate above, and bearing scattered cylindrical polyp-cells; polypes semiretractile. *C. bocagii*, near Setubal, Portugal.

Anthozoanthus parasiticus, Deshayes: described by Carter, Ann. N. H. (4) v. p. 449.

Eumepthya thyrsoides, Verrill, = *Nepthya thyrsoides*, Verrill (Proc. Ess. Inst. vol. vi. p. 81); *Spongodes capitata*, Verrill, = *Spoggodes capitata*, Gray (*ib.* p. 81); *Spongodes gracilis*, Verrill, = *Spoggodia gracilis*, Gray (*ib.* p. 81). Verrill here contends that the orthography should be "Spongodes," not "Spoggodes" or "Spoggodia," as Dr. Gray has it. *Teleso ramiculosa*, Verrill, = *Teleso ramulosa*, Gray (*ib.* p. 82): *Teleso*? *nodosa*, Verrill, = *Telescella nodosa*, Gray (*ib.* p. 82); according to Verrill, this may not belong to Alcyonaria at all, having no spicules, but may possibly consist of the tubes of some annelid or crustacean (*ib.* p. 82).

Teleso africana, sp. n., Verrill (Am. J. Sc. vol. xlix. 1870, p. 372), Sherbro Island, West Africa. *T. corallina*, sp. n., Duchassaing (*l. c.* p. 19), Guadeloupe.

Anthela latebrosa, sp. n., Duchassaing (*l. c.* p. 11), Guadeloupe.

Nepthya rubescens, sp. n., Duchassaing (*l. c.* p. 12), Guadeloupe.

Phrontis, g. n., Duchassaing (*l. c.* p. 12). Type *P. submersus*, sp. n., Marie-Galante.

Icligorgia, g. n., Duchassaing (*l. c.* p. 12). Type *I. schrammi*, sp. n., Guadeloupe.

Pennatulidæ.

KÖLLIKER describes (Abh. senck. Ges. vii. p. 487) the following new species:—

Virgularia lyngmanii (*l. c.* p. 536, figs. 133, 134), Fayal, Azores; *V. steenstrupi* (p. 539, figs. 128, 129), Varangerfiord, in Finmark; *V. loveni* (p. 541, figs. 121, 122), Port Jackson; *V. rumphii* (p. 542, figs. 123, 124), Amboyna; *Stylatula lacazii* (p. 562, figs. 132, 136), loc. unknown; *S. kimbergi* (p. 563, figs. 140, 141), loc. unknown; *S. darwini* (p. 567) = *Virgularia patachonica*, Gray, Patagonia; *S. antillarum* (p. 568), Antilles; *Scytalium mertensi* (p. 576, figs. 125, 126), Chinese Seas.

Acanthoptilon, g. n., Köll. (*ib.* p. 569), not noticed in his conspectus of genera. Long, slender; sarcosome thin; pinnules small, triangular, supported below by plates of calcareous spicules; polype-cells armed with spicules, polypes without calcareous bodies. At the lower end of the colony a loose row of leaflets becoming smaller till they run out in a lateral row of zooids; zooids ventral; shaft without radial canals; sexual organs in the more developed pinnules. Axis roundish, angular, with very short radial fibres. *A. pourtalesi*, sp. nov., Köll. (*ib.* p. 571, figs. 153, 159), Marquesas, &c.; *A. agassizi* (p. 572, figs. 156, 157), Carysfort Reef.

Gorgoniidæ.

Dr. GRAY (Cat. Stony Corals) establishes the following new genera and species:—

* *Cereopsis*, Lath., *Aves*, 1790; Dupont, *Coleoptera*, 1834.—R. H. T.

Melittella flabellata (p. 6), loc. incert.; *M. atrorubens* (= *Melitteia ochracea* (pt.), Lamx. MSS.), India; *M. linearis*, loc. incert., spp. nn. (pp. 5, 6).

Clathraria acuta, sp. n. (p. 12), loc. incert.

Trinella (g. n.) *swinhoi* (p. 12), Formosa.

Acanella, g. n. (p. 16). *A. arbuscula* (Johnson).

Equisetella, g. n. (p. 18). *Isis gregorii* (Gray, 1868).

Gorgonella cumingi, sp. n. (p. 28), Philippines.

Viminella, g. n. (p. 28). *V. juncea*, Gray (p. 29) = *Juncella vimen*, M.-Edw. & Haime.

Reticella, g. n. (p. 30), *flexuosa* (M.-Edw. & Haime).

Brandella intricata, sp. n. (p. 31), = *Raynerella aurantia*, Gray (1869).

Wrightella (g. n.) *chrysanthos*, *coccinea*, spp. nn., Gray (p. 32), Seychelles, Ceram.

Xiphocella, g. n. (p. 36), *esperii* (p. 36), = *Gorgonia verticellata* (Esper).

Plumarella, g. n. (p. 36), = *Gorgonia penna*, Lamk., and *Callogorgia plumatilis*, Gray.

Callicella (g. n.) *elegans*, sp. n. (p. 37), Formosa.

Nicella (g. n.) *mauritiana* (p. 40), = *Scirpearia dichotoma*, Gray (1859).

Thouarella, g. n. (p. 45), *antarctica* (Valenc.).

Hookerella (g. n.) *pulchella* (p. 45), Antarctic Ocean.

Fanella, g. n. (p. 46), *compressa* (Verrill).

Stenella, g. n. (p. 48), *imbricata* (Johnson).

Narella, g. n. (p. 49), *regularis* (Duchass. & Michel).

Dichotella (g. n.) *divergens* (p. 50), loc. incert.

Dr. GRAY (Ann. N. H. (4) v. pp. 405-408) has established the following new genera from specimens in the British Museum:—

Busella, gen. nov., Gray (*ibid.* p. 405). *B. occatoria* = *Rhipidogorgia occatoria*, M.-Edw. & Haime, Guadeloupe.

Muritella, gen. nov., Gray (*ib.* p. 405). *M. fucosa* = *Gorgonia fucosa*, Valen. (= *Gorgonia palma* var. *alba*, Esper, and *G. albicans*, Köll.).

Boarella flabellata, gen. et sp. nov., Gray (*l. c.* p. 406). Coral branched in a plane, fan-shaped, forming an oblong frond with a single stem; branches and branchlets slender, nearly of the same diameter, netted; branches diverging and often inosculating, some of the marginal branchlets free. Bark thin, formed of thin scales or spicules. Polyp-cells subcylindrical, elongate, truncate, membranaceous, translucent, with a circular mouth with 10 marginal folds and 10 short valves in an irregular series on each side of the branches, diverging in different directions, one, sometimes two or three together. Axis continuous, horny. British Museum. Locality unknown.

Menacella, gen. nov., Gray (*l. c.* p. 406). *M. reticularis* = *Gorgonia reticularis*, Pallas.

Phaeocella, gen. nov., Gray (*l. c.* p. 406). *P. tuberculata* = *Gorgonia tuberculata*, Esper.

Bovella ramulosa, gen. et sp. nov., Gray (*l. c.* p. 407). Coral branched, fan-shaped, expanded into an oblong frond; stem simple; branches and branchlets slender, of the same diameter throughout, branches radiating and irregularly furcately divided, with abundance of short branchlets arranged rather pinnately and diverging at nearly right angles, forming a more or less regular network; many of the branchlets, especially the marginal ones, free. Bark furfuraceous, formed of very small soft spicules or thin scales. Polyp-cells circular, prominent, with a sunken centre and a furfuraceous surface,

placed on all sides of the branchlets and on the internal surface of the branches. Axis continuous, horny, black. British Museum. Locality not given.

Menella indica, gen. et sp. nov., Gray (*l. c.* p. 407). Coral cylindrical, end (of the branches?) clavate, rounded, surface spiculose. Polype-cells on all sides of the cylindrical stem (and branches), close together, forming a rough spiculose surface with hexagonal areolæ. Polypes retractile; when retracted, convex, with an oblong concavity, surrounded with spicules. Axis horny, black. *Hab.* Bombay.

Lignella, gen. nov., Gray (*l. c.* p. 407). *L. richardi*=*Gorgonia richardi*, Lamx.

Leucoella cervicornis, gen. et sp. nov., Gray (*l. c.* p. 407). Coral branched, fan-like, in the same plane, compressed; branches furcate, upper side convex or angular, lower side concave, smooth, barren, with a more or less wide central groove. Bark thin and smooth. Polype-cells large and spherical, scattered or in lines on the upper surface and margin of the stem and branches. Axis white, wood-like, soft, with fusiform warty spicules, which are generally slender and elongate, but some are thicker and more ventricose. Brit. Mus. Loc. unknown.

Rhipidella verticillata, Solander. This, the *Gorgonia verticillata*, Esper, *Rhipidogorgia verticillata*, M.-Edw. & Haime, and *Suberigorgia verticillata*, Köll., should be restored as a distinct generic type (Gray, *loc. cit.* p. 407).

Vioa asbestina, Nardo. In like manner, Dr. Gray (*loc. cit.* p. 408) re-establishes Nardo's generic term for this coral (= *Lobularia asbestina*, Ehr., *Briareum asbestinum*, Verrill, and *B. suberosum* (pars), Köll.).

From conclusions arrived at after careful examination of the calcareous spicula in the sections *Primnoaceæ*, *Gorgoniaceæ*, and *Gorgoniellaceæ* of the subfamily Gorgoniinæ and family Gorgoniidæ, Mr. W. S. Kent (M. Micr. J. Feb. 1870, pp. 76-94), proposes the following alterations in the nomenclature of certain species:—To *Muricea* should be referred *Gorgonia plantaginea*, Lmk. (*Eunicea plantaginea*, M.-Edw.); to *Echinogorgia*, Köll., *Rhipidogorgia coarctata*, M.-Edw., *Muricea fungifera*, M.-Edw., and *Gorgonia granifera*, Lmk.; to *Eunicea*, *Plexaura pensilis*, Val., and *P. pendula*, Val.; to *Plexaurella*, *Gorgonia heteropora*, Lmk.; to *Gorgonia*, *Muricea placomus*, Val. & M.-Edw. (non Esp.), *Plexaura racemosa*, Val., *Verrucella furcata*, M.-Edw.; to *Leptogorgia*, *Gorgonia miniata*, *pumicea*, and *ramulus*, M.-Edw. Spicules of the Leptogorgian type occur in various modifications in each of the following genera of Milne-Edwards:—*Lophogorgia*, *Pterogorgia*, *Xiphigorgia*, *Rhipidogorgia*, *Phyllogorgia*, *Hymenogorgia*, *Phycogorgia*, and *Gorgonella*. *Verrucella violacea* should probably be made the type of a new genus, having incorporated with it *Gorgonia lilacina* and *sanguinolenta*, Val. To *Juncella* should be referred *Ctenocella pectinata*, *Primnoa myura*, *Leptogorgia boryana*, *Rhipidogorgia lacuens*, *plagalis*, *umbraculum*, *Pterogorgia betulina*, *Verrucella flexuosa*.

The following new species are described by Verrill, Tr. Conn. Acad. i. p. 551-558:—

Leptogorgia tenuis, La Paz; *L. lobata*, sp. n., = *L. ramulus*, variety, Acapulco, Cape St. Lucas, &c.; *L. exigua*, Acapulco, Corinte, &c.: Verrill, Tr. Conn. Ac. i. pp. 551-553. *L. robusta* and *L. dichotoma*, Sherbro' Island, W. Africa, Verrill, Am. J. Sc. xlix. p. 374, 375.

Eugorgia multifida, sp. n., Verrill (Tr. Conn. Ac. i. p. 554), La Paz, Matatlan, &c.

Heterogorgia papillosa, sp. n., Verrill (*l. c.* p. 557), La Paz.

Muricea granulosa, sp. nov., Verrill (*Am. J. Sc.* xlix. p. 373), Sherbro' Island, West Africa.

The following are the additions and corrections given by Verrill (*P. Ess. Inst.* vol. vi. pt. 1, p. 75 *et seq.*) to the Gorgoniidæ described in the previous part of his synopsis of the polypes and corals of the North-Pacific Exploring Expedition:—

Litigorgia cuspidata, Verrill (*loc. cit.* p. 75) = *Leptogorgia cuspidata*, Verrill.

Euplexaura, gen. nov., Verrill (*l. c.* p. 75). Resembling *Plexaurella*, with rather large open cells. Spicules mostly short, blunt, warty spindles, of rather small size, with a few small, simple, double spindles, and, rarely, small irregular crosses. *E. capensis*, sp. n., Verrill (p. 76), = *Plexaura friabilis*, Verrill.

Muricea flexuosa, Verrill (*l. c.* p. 77), = *Lissogorgia flexuosa*, Verrill. The genus *Lissogorgia* is no longer necessary, because the typical species prove to belong to *Paramuricea*, Köll. *Villogorgia* and *Blepharogorgia*, Duch. & Mich., are probably also synonyms.

Astrogorgia sinensis, Verrill (*l. c.* p. 77), = *Muricea sinensis*, Verrill.

Anthogorgia divaricata, Verrill (*l. c.* p. 78), = *Muricea* (?) *divaricata*, Verrill.

Echinomuricea coccinea, Verrill (*l. c.* p. 79), = *Acanthogorgia coccinea*, Verrill.

The following are given by Duchassaing (*l. c.* pp. 13–18):—

Dendrogorgia, g. n. Type *D. parvula*, sp. n., Guadeloupe.

Gorgonia letellieri, sp. n., Guadeloupe.

Pterogorgia esperi, sp. n., = *Gorgonia violacea*, Esper.

Melithæa occidentalis, sp. n., St. Thomas.

ZOANTHARIA.

MALACODERMATA.

Cereus stimpsoni, sp. n., allied to *C. bellis*, Oken, Cape of Good Hope, False Bay; *C. sinensis*, coast of China: Verrill, *Pr. Ess. Inst.* vi. pp. 53, 54.

Sagartia paguri, sp. n. (= *Carcinophilus paguri*, Stimpson, MS.), Chinese seas, always parasitic on *Diogenes edwardsi*; *S. lineata*, sp. n., Hong Kong; *S. nigropunctata*, sp. n., = *Actinia nigropuncta*, Stimpson; *S. napensis*, sp. n., = *Actinia napensis*, Stimpson: Verrill, *l. c.* pp. 57, 58.

Bunodes inornata, sp. n., = *Actinia inornata*, Stimpson; *B. japonica*, sp. n., Hakodadi Bay, Japan: Verrill, *l. c.* pp. 61, 62.

Urticina coccinea, Verrill (*l. c.* p. 63), = *Rhodactinia coccinea*, Verrill (1866).

Physactis, g. n., Verrill (*l. c.* p. 63). Base as broad as the disk. Column short, cylindrical, with a fold below the margin, beneath which its sides are covered with prominent and persistent scattered verrucæ; above the fold the texture is softer and smoother, and the surface is crowdedly covered with small, inconspicuous, soft papillæ or verrucæ, arranged in vertical lines. Tentacles not very numerous, stout, fusiform or conical, pointed, apparently not contractile, and not capable of involution. *Ph. multicolor*, sp. n., Verrill, near Hong Kong, China.

Anthopleura stimpsonii, sp. n., Verrill (*ib.* p. 66), Hong-Kong Harbour.

Amphiactis, g. n., Verrill (*ib.* p. 67). Base broad. Column covered with

prominent verrucæ, arranged in vertical lines. Simple tentacles, in several rows, submarginal, with compound and much subdivided tentacle-like organs both outside and inside of them, the latter covering the disk more or less completely. *A. orientalis*, sp. n., Verrill, Bonin Islands.

Dicostoma fungiforme, sp. n., Verrill (*ib.* p. 70), Port Lloyd, Bonin Islands.

Homactis, g. n., Verrill (*ib.* p. 71). Column low, cylindrical, with a distinct fold near the margin; substance firm, surface smoothish. Disk not much wider than the column, concave, the whole surface, except a narrow region about the mouth, covered with small rounded perforated tubercles, arranged in wide radiating series, in which they are crowded in several transverse rows. Tentacles marginal, in life longer, with imperforate tips; in alcohol scarcely different from the tubercles in appearance. Mouth large. *H. rupicola*, sp. n., Verrill, Hong Kong.

Stephanactis, g. n., Verrill (*ib.* p. 72). Column subcylindrical, somewhat elongated, not verrucose; substance firm and dense. Disk exceeding the column, covered with regular radiating lines of short unequal tubercles. The outer tubercles or tentacles are largest, and divided into several (3-5) short rounded lobes; the next within are 2-3-lobed; the innermost are simple, rounded, or papilliform verrucæ. The disk and tentacle-like organs do not seem to be capable of contraction, being fully expanded in alcohol. *S. indica*, sp. n., Verrill, Selio Island, Gaspar Straits.

Corynactis annulata, Verrill (*ib.* p. 74), = *Melactis annulata*, Verrill (1866).

Heterozoanthus, g. n., Verrill (*Am. J. Sc.* xlix. p. 371). Polyps creeping on the surface of sponges &c. by thin basal stolon-like expansions of the base, from which the polyps arise in linear series. Polyps short, capable of contracting to a level with the basal membrane. Tentacles few, 12 to 24. Integument stiffened by foreign bodies imbedded in the skin, such as spongyopacula &c. *H. scandens*, Sherbro' Island, West Africa; *H. swifti*, Verrill, = *Gemmaria swifti*, Duch. et Mich; *H. axinellæ* (Schmidt, sp.), Adriatic.

SCLEROBASICA.

Antipathes taxiformis and *A. melancholica*, Desieada, West Indies; *Arachnopathes columnaris* and *Rhipidipathes tristis*, Guadeloupe: spp. nn., Duchassaing (*l. c.* pp. 22, 23).

SCLERODERMATA.

Results of 'Porcupine' Expedition.—Dr. P. M. Duncan having examined the Stony Corals dredged up in the 'Porcupine' Expedition, has determined 12 species, the majority of which came from midway between Cape Wrath and the Færoes; others were also found off the west coast of Ireland. The species may be enumerated thus:—

Five species which have lasted since the early Cænozoic period, being found on the area dredged and as Miocene and Pliocene fossils elsewhere, viz.:—*Caryophyllia borealis*, Flem.; *Ceratocyathus ornatus*, Seguenza; *Flabellum laciniatum*, M.-Edw. & Haine; *Lophohelia prolifera* (Pallas); *Amphihelia miocenica*, Seguenza. Two of these, *Caryophyllia borealis* and *Lophohelia prolifera*, occur likewise in the recent fauna of the Mediterranean.

One Mediterranean species not known in Cainozoic deposits, viz. *Amphihelia oculata*, Linn., sp.

Three species belonging to the deep-sea fauna of Florida and Havana, viz. :—*Balanophyllia socialis* (Pourtales), *Amphihelia profunda* (Pourtales), and *Phiothrus symmetricus* (Pourtales).

Lastly, three species known only on the area dredged or in the neighbouring seas, viz. :—*Amphihelia atlantica*, Duncan; *A. ornata*, sp. n., Duncan; *Allopora oculina*, Ehr.

'Norna' Expedition.—Mr. W. S. Kent enumerates *Caryophyllia smithi*, Stokes, *Desmophyllum crista-galli*, M.-Edw., *Lophohelia prolifera*, M.-Edw., *Amphihelia oculata*, M.-Edw., and *Dendrophyllia ramea*, Blainv., as taken off the coasts of Portugal, Ann. N. H. (4) vi. p. 459.

Classification.—Verrill proposes to unite the following families into a suborder, *Oculinaceæ*, intermediate in many respects between *Madreporaceæ* and *Astræaceæ*, having, as in the former, the polyps exsert, and with their tentacles swollen at the tips,—as in the latter, the corals imperforate and compact :—

Suborder *Oculinaceæ*. Families : 1. *Stylasteridæ*, 2. *Oculinidæ*, 3. *Pocilloporidæ*, 4. *Styloporidæ*, 5. (P) *Stylinidæ*, 6. *Astrangidæ*, 7. *Caryophyllidæ*.

The *Pocilloporidæ* are here included, though they have transversely septate or tabulate corals. Observations on the polyps show that the family has the structure of *Madreporaria*, and no affinity with *Millepora* or other Hydroid Corals. (See also Proc. Ess. Inst. vi. pt. 1, p. 90.) As to *Caryophyllidæ*, the typical genera *Caryophyllia*, *Paracyathus*, &c. seem to belong here, as they have soft parts with the same general structure as in *Oculina*, *Astrangia*, &c.; but *Flabellum*, like *Euphyllia*, seems better to agree with *Astræaceæ*.

Mr. W. S. KENT likewise disputes the theory that all the "tabulate" Corals are to be regarded as the skeletal productions of Hydrozoa (Ann. N. H. (4) Nov. 1870, p. 386).

MADREPORARIA APOROSA.

Turbinolidæ.

DUNCAN (l. c. p. 292) includes as varieties of *Caryophyllia borealis*, Flem., the old species *C. clavus*, *C. smithii*, and *C. cyathus*.

Mr. W. S. KENT, while agreeing with Dr. Duncan that *Caryophyllia smithi*, *borealis*, and *clavus* are merely varieties of the same species, does not think that there are sufficient grounds for uniting with these, as Dr. Duncan proposes, the Mediterranean *C. cyathus* (Ann. N. H. (4) vi. p. 459).

Caryophyllia sinuosa, *corona*, and *protei*, spp. nn., from the Antilles : Duchassaing (l. c. p. 24).

Paracyathus humilis, sp. n., Verrill (Tr. Conn. Ac. i. p. 538), Pearl Island.

Desmophyllum crista-galli, M.-Edw. With this should be united *D. russi*, Michelotti (Kent, Ann. H. (4) vi. p. 459).

Desmophyllum simplex, sp. n., Verrill (Am. J. Sc. xlix. p. 371), St. Thomas, West Indies.

Flabellum laciniatum, M.-Ed. & Haime, = *Ulocyathus arcticus*, Sars (Duncan, l. c. p. 293).

Oculinidæ.

Lophohelia prolifera. As varieties of and synonymic with this well-known coral, Dr. Duncan (*l. c.* pp. 293, 294) proposes to unite the following, hitherto recognized as distinct species, viz. :—*Lophohelia anthophyllites*, Edw. & Haime; *L. subcostata*, Edw. & H.; *L. affinis*, Pourtales; *L. defrancei*, De-france; *L. gracilis*, Seguenza.

Amphiheia profunda, sp. n., and *A. ornata*, sp. n., Duncan (*l. c.* p. 295). 'Porcupine' Expedition, in lat. 59° 56' N., long. 60° 27' W., depth 363 faths.

Amphiheia and *Diploheia*, Edw., considered by Duncan to be identical (*ib.* pp. 294, 295).

Allopora venusta, sp. n., Verrill (Tr. Conn. Ac. i. 1870, p. 517), = *A. californica*, Pourtales (*non* Verrill), Neah Bay, Washington Territory.

Stenohelia, g. n., Kent (Ann. N. H. (4) Feb. 1870, p. 120). Corallum dendroid, flabelliform; surface of the cœnenchyma delicately striate. Calices all turned one way, pedunculate, compressed transversely to the axis of their peduncles. Septa equal, scarcely exsert. Columella styliform, deeply immersed. Pali rudimentary. Calicular fossa deep. Increasing somewhat irregularly by alternate distichal or subdichotomous gemmation. Ampullæ not essential, developed to a more or less considerable extent. *S. maderensis*, Kent (*l. c.* p. 121), = *Allopora maderensis*, J. Y. Johnston, Madeira; *S. complanata*, Kent (*l. c.* p. 123), = *Stylaster complanatus*, Pourtales.

Stylophora dumetosa, sp. n., Duchass. (*l. c.* p. 26), Guadeloupe.

Astræidæ.

Lophosmilia urena, sp. n., Duchass. (*l. c.* p. 26), Guadeloupe.

Oxysmilia, g. n. Type *Lophosmilia rotundifolia*, MM. Edw. & Haime: Duchass. (*l. c.* p. 27).

Thalamophyllia, g. n. Type *Desmophyllum riisii*, Duchass. & Michel.: Duchass. (*l. c.* p. 28).

Astrangia pedersenii, sp. n., Verrill (*l. c.* p. 529), La Paz, Guaynas.

Astrangia (*Cænangia*) *conferta*, sp. n., Verrill (*ib.* p. 530), Gulf of California.

Pocilloporidæ.

Pocillopora gracilis, sp. n., Verrill (Proc. Ess. Inst. vi. pt. 1, p. 90), Loo-Choo Islands; *P. aspera*, sp. n. (p. 93), = *P. favosa*, Dana (pt.) *non* Ehrenb., and *P. plicata*, Dana (pt.); *P. favosa*, var. *lata*, Verrill, = *plicata*, Dana (pt.), Hawaiian Islands; *P. frondosa*, sp. n. (p. 96), Hawaiian Islands; *P. lacera*, sp. n. (p. 100), Acajutla and Pearl Island; *P. capitata*, var. *porosa*, v. nov. (p. 99), La Paz; *P. capitata*, var. *robusta*, v. nov., Verrill (Tr. Conn. Ac. i. p. 521), Gulf of California.

Fungiidæ.

Fungia elegans, Verrill, sp. n. (Am. J. Sc. xlix. p. 100), La Paz.

Agaricia frondosa, sp. n., Duchass. (*l. c.* p. 31), St. Thomas.

MADREPORARIA PERFORATA.

Madreporidæ.

Madrepora microphthalmia, sp. n., Verrill (Proc. Ess. Inst. vi. pt. 1, p. 83), Loo-Choo Islands.

Heteropsammia geminata, sp. n., Verrill (Am. J. Sc. xlix. p. 370), Burmah.

Rhizopsammia, g. n., Verrill (*ib.* p. 510). Corallum compound, low, incrusting, extending by stolon-like expansions of the base, from which the buds arise. Corallites cylindrical, or nearly so, connected by thin creeping extensions of the base, which have the same porous texture as the wall. Polype-cells subcircular or elliptical. Septa thin, crowded, a little projecting, arranged in four or five cycles, those of the last cycle well developed, uniting to those of the preceding cycle, which rise up in the form of prominent pali-form lobes, beyond which the central region of the cell is deep. Columella very porous, its surface papillose. Walls very porous, destitute of epitheca, with scarcely distinct costæ, but with series of rough granules. *R. pulchra*, sp. nov., Verrill (*ib.* p. 510), Pearl Island.

Turbinaria dichotoma, sp. n., Verrill (*ib.* p. 89), locality unknown, probably Bonin or Loo-Choo Islands.

Poritidæ.

Porites californica, sp. n., Verrill (Tr. Conn. Ac. i. p. 504), Gulf of California; *P. porosa*, sp. n., Verrill (*ib.* p. 504), Gulf of California; *P. excavata*, sp. n., Verrill (*ib.* p. 504), Pearl Island; *P. nodulosa*, sp. n., Verrill (*ib.* p. 505), Gulf of California.

Favositopora, g. n., Kent (Ann. N. H. (4) vi. p. 385). Resembling *Alveopora*, but with transverse septa or tabulæ. This genus is interesting as supplying a link between the long-extinct genus *Favosites* (through the cretaceous *koninekia*) and the *Madreporaria perforata*. Its structure and its close relations with *Alveopora* help to demonstrate the untenableness of the doctrine that "tabulate" Corals are necessarily the productions of Hydroid polypes. *E. deshayesii*, sp. n., Kent (*ib.* p. 385), Paris Museum, locality unknown. *F. paleozoica*, sp. n., Kent (*ib.* p. 386), fossil, probably North-American, Devonian, or Carboniferous; specimen in the British Museum; locality unknown.

Montipora ezera, sp. n., Verrill (Proc. Ess. Inst. vi. pt. 1, p. 84), = *M. foliosa*, ? Verrill, non Edw. & Haime, Gaspar Straits; *M. lichenoides*, sp. n., Verrill (*ib.* p. 86), Loo-Choo Islands; *M. patula*, sp. n., Verrill (*ib.* p. 87), Hawaiian Islands.

PROTOZOA

BY

RAMSAY H. TRAQUAIR, M.D.

SPONGIIDA.

BOCAGE, J. V. BARBOZA DU. Sur l'existence de la "*Holtenia carpenteri*," Wyville Thomson, dans les côtes du Portugal. Journ. Sc. Lisb. 1870, p. 79.

CARTER, H. J. Note on the Sponges *Grayella*, *Osculina*, and *Chiona*. Ann. N. H. (4) vi. pp. 73-83.

———. On two new species of Subsphaerous Sponges, with observations. Ann. N. H. (4) vi. pp. 176-182.

———. On the ultimate structure of Marine Sponges. Ann. N. H. (4) vi. pp. 329-341.

DUCHASSAING (de Fontbressin), P. Revue des Zoophytes et des Spongiaires des Antilles. 8vo. Paris: 1870.

GRAY, J. E. Note on a new genus of Sponge from West Australia. Ann. N. H. (4) vi. p. 272.

Dr. Gray here proposes the name *Echinospongia australis* for a sponge from Nichol's Bay, West Australia, but subsequently revokes it (*tom. cit.* p. 346), being assured that it is the same with one he had previously named *Axos cliftoni*.

———. Notes on anchoring Sponges (in a letter to Mr. Moore). Ann. N. H. (4) vi. pp. 309-314.

KENT, W. S. Notice of a new Vitreous Sponge, *Pheronema (Holtenia) grayi*. Ann. N. H. (4) vi. pp. 182-186.

———. On two Siliceous Sponges taken in the late Dredging-expedition of the yacht 'Norna' off the coasts of Spain and Portugal, Ann. N. H. (4) vi. pp. 217-224.

———. On the "*Hexactinellidæ*," or hexradiate spiculed Siliceous Sponges taken in the 'Norna' expedition off the coast of Spain and Portugal. M. Micr. J. 1870, pp. 241-252.

KENT, W. S. On a new anchoring Sponge, *Dorvillia agarici-formis*. M. Micr. J. 1870, pp. 293-295.

LEIDY, J. Remarks on some curious Sponges (*Hyalonema*, *Euplectella*, *Pheronema*). Am. Nat. iv. p. 17 et seq.

MIKLUCHO-MACLAY, N. Ueber einige Schwämme des nördlichen stillen Oceans und des Eismeeres. Ein Beitrag zur Morphologie und Verbreitung der Spongien. Mém. Péters. 1870.

Contains descriptions of several new forms, with remarks also on the morphology of sponges in general.

——. Bemerkungen zur Schwammfauna des weissen Meeres und des arktischen Oceans. Bull. Pétersb. June 1870, pp. 203-205.

SCHMIDT, O. Grundzüge einer Spongienfauna des atlantischen Gebietes. Mit sechs Tafeln. Fol. Leipzig: 1870.

This important work, extensive as it is, does not profess to be an exhaustive monograph of the subject. It deals almost exclusively with the siliceous sponges, Häckel being, as is well known, at present occupied with a special monograph of the calcareous forms. It comprises:—I. Considerations relative to classification, viz.:—*a*, typical forms and variability of the spicules; *b*, the fibrous networks and arrangement of the hard parts; *c*, analogical and homological structures. II. Special description of the sponges occurring in the region of observation, many of which are only noticed generically. To this part is appended a table of comparison between Bowerbank's British species (siliceous and horny) and those of the author. III. Results relative to geographical distribution and to classification. A table of geographical distribution is given, as likewise an embodiment of the author's ideas as to the natural classification of sponges, in the form of a genealogical tree of the various families.

——. Das natürliche System der Spongien. Mitth. Ver. Steierm. ii. 1870, pp. 261-269.

The substance of this paper is included in the preceding larger work.

STEWART, C. On a new Sponge, *Tethyopsis columnifer*. Q. J. Micr. Sc. 1870, pp. 281, 282.

VAILLANT, L. Note sur la disposition des pores ou orifices afférents dans la *Cliona celata*. C. R. lxx. 1870, pp. 41-43. Translated Ann. N. H. (4) v. pp. 146-148.

WRIGHT, E. PERCEVAL. Notes on sponges.—1. On *Hyalonema mirabilis*, Gray. 2. On *Aphrocallistes bocagei*, sp. nov. 3. On a new genus and species of Deep-sea Sponge. Q. J. Micr. Sc. 1870, pp. 1-9.

Geographical Distribution.

The following species are given by O. Schmidt (*op. cit.*) as occurring on both sides of the Atlantic:—

Aphrocallistes bocagei, *Corallistes polydiscus*, *Chondrilla nucula*, *Aplysina ærophoba*, *Siphonochalina densa*, *Papillina suberia*, *Desmacella johnsoni*, *Des-*

macidon infestum, *Eesperia massa*, *Dictyonella cactus* (?), *Axinella polytroides*, *Phakellia ventilabrum*, *Hymeraphia verticillata*, *Craniella tethyoides*, *Stelletta discophora*, *Tisiphonia agariciformis*. Also undetermined varieties of *Spongelia*, *Euspongia*, *Filifera*, *Pachychalina*, and *Tedania*.

The following genera are common to the two shores:—

Holtenia (*Pheronema*), *Aphrocallistes*, *Leiodermatium*, *Corallistes*, *Cellulophana*, *Chondrilla*, *Spongelia*, *Euspongia*, *Cacospongia*, *Aphysina*, *Filifera*, *Chalina*, *Siphonochalina*, *Sclerochalina*, *Pachychalina*, *Chalinula*, *Reniera*, *Amorphina*, *Pellina*, *Tedania*, *Schmidtia*, *Plicatella*, *Suberites*, *Papillina*, *Radiella*, *Tethya*, *Desmacella*, *Desmacidon*, *Cribrella*, *Eesperia*, *Dictyonella*, *Clathria*, *Axinella*, *Phakellia*, *Raspaila*, *Hymeraphia*, *Tetella*, *Craniella*, *Ancorina*, *Stelletta*, *Geodia*, *Caminus*.

MIKLUCHO-MACLAY, in noticing some siliceous sponges of undetermined species, save *Velupa polymorpha*, M.-Maclay, varieties *digitata* and *arctica*, along with one calcareous form, a *Sycum* of considerable size, all from the White Sea and Arctic Ocean, states that his results are at variance with the conclusion of O. Schmidt, viz. that in the colder regions the siliceous sponges are feebly developed in comparison with the calcareous. These views may prove correct for the sponges of the Greenland coast, on which Schmidt's conclusions were based, but they do not appear conclusive for the sponge-fauna of the Eastern Polar seas, where the siliceous sponges seem to predominate. (Bull. Pétersb. June 1870, t. xv. pp. 203-205.)

The following are the "Vitreous" or Hexactinellate sponges enumerated by Mr. W. S. Kent as taken in the 'Norna' dredging-expedition off the coasts of Spain and Portugal (M. Micr. J. 1870, pp. 241-252):—

Pheronema grayi, Kent; *Askonema setubalense*, Kent; *Hyalonema lusitanica*, Gray; *Lanuginella pupa*, O. Schmidt; *Aphrocallistes bocagii*, E. P. Wright; *Farrea occa*, Bbk.; *Aulodictyon woodwardi*, Kent; *Dactylocalyx*, sp.; *Fieldingia lagettoides*, Kent.

BOCAGE (*l.c.*) records the taking, in depths of 450-500 fathoms, of five specimens of *Holtenia* (*Pheronema*) *carpenteri* in the same localities off the Portuguese coast in which *Hyalonema lusitanicum* occurs. When fresh, the sarcode was of an orange-colour.

Various sponges, the most interesting being *Hexactinellidae*, are recorded by Carpenter, Jeffreys, and W. Thomson as taken in the 'Porcupine' expeditions of 1869 and 1870 (P. R. Soc. xviii. pp. 397-492, and xix. pp. 146-221). In the Report of the former are mentioned *Adrasta infundibulum*, *Tisiphonia*, sp., *Phakellia ventilabrum*, and a new and unnamed genus allied to *Eesperia*. In that of the latter to the coasts of France, Spain, Portugal, and the Mediterranean, mention is made of *Pheronema* (?) *velatum* (sp. n., W. Thomson), *Askonema setubalense*. *Pheronema carpenteri* and *Aphrocallistes bocagii* occurred in both.

Structure, Morphology, and Classification.

HÄCKEL's paper "On the organization of Sponges and their relationship to the Corals" (Jen. Z. Nat. Bd. v. 1869) is translated by Mr. W. S. Dallas in Ann. N. H. (4) v. pp. 1-13 and 107-120. His view that the sponges belong to the *Cœlenterata* is disputed by Mr. W. S. Kent (*tom. cit.* pp. 204-218, and *op. cit.* vi. pp. 250-255), but defended by Mr. E. R. Lankester (*tom. cit.* pp. 86-93). Oscar Schmidt (*l.c.* p. 84) declares himself averse to the views of Häckel on this point.

MIKLUCHO-MACLAY (Mém. Pétersb. 1870) considers the pores and oscula of sponges homotypic structures, and that the osculum may originate by the union of pores or by the development of a pore. If this be the case, then, as Oscar Schmidt remarks (*op. cit.* p. 84), the whole coelenterate theory falls to the ground, as the mouths and cutaneous pores of coelenterate polypes, with which the oscula and pores of sponges have been compared, are certainly not homotypic or homologous structures. But Schmidt does not think that Macley's theory is borne out by the simplest sponges, though in *Geodinae* in some cases pores may enlarge to pseudoscula.

CARTER (Ann. N. H. (4) vi. pp. 329-341) notices in marine sponges (*Halichondria simulans*, Johnston, and *Grantia nivea*) the tessellated aggregations of sponge-cells which he previously described in *Spongilla* as "ampullaceous sac," and which he considers to be the special digestive organs of the sponge. Carter thinks that the sponges, as possessing distinct channels for excretory purposes, are more akin to the Polyzoa and Tunicata than to the Corals, and compares also the canaliferous structure of the *cénosarc* of compound Tunicata to the canal-system of sponges (*ib.* p. 336). Regarding the question of sexual generation in the sponges, Carter likewise mentions certain unciliated bodies in *Microciona atrosanguinea*, which he considers may possibly be spermatozoa, and certain minute spherical cells or capsules in *Halichondria panicea*, possibly true sexual ova (*ib.* pp. 339-341).

LIEBERKÜHN (Ann. N. H. (4) vi. p. 497) maintains that the contractile substance of *Spongilla* consists of independent nucleated cells, separable by heating the sponge to a temperature of about 140° F., and that in certain cases, as in the formation of the siliceous parts of the gemmules, the sponge-cells may reproduce the plan of the vegetable cell. [The Recorder has not had an opportunity of seeing the original paper on the "Motory Phenomena of Animal Cells," in *Schriften Ges. Marburg*, ix.]

VAILLANT (*l. c.*) describes two sorts of papillæ in *Cliona celata*; the first with large openings, the second more numerous, with small openings, misunderstood by Grant, who supposed they were a transitory state of the large ones. According to Vaillant the large ones are oscula, the small are pores or inhalant openings.

CARTER (Ann. N. H. (4) v. pp. 73-83), after comparing *Grayella cyathophora*, Carter, and *Osculina polystomella*, O. Sdt., with *Cliona northumbrica*, Hancock, comes to the conclusion that the two former are free forms of the Clionidæ. *Raphyrus griffithsi*, Bbk. (given by Schmidt as a synonym of his *Papillina suberea*), he considers to be but a free form of *Cliona celata*, Lbk. He considers (*ib.* p. 82) the question decided that certain sponges may feed on the organic matter of shell-substance, just as certain fungi feed on woody tissue.

OSCAR SCHMIDT (Spong. Atlant. p. 13) proposes the term *Hexactinellidæ* for the siliceous sponges with sexradiate spicules (*Vitreæ*, Wyville Thomson). In a second new family, *Lithistidæ*, the same author includes his new genera *Leiodermatium* and *Corallistes*. They have a continuous siliceous skeleton; but its fibres or spicules do not belong to the sexradiate type, but form an apparently quite irregular confused network.

The same author (*op. cit.*) divides the sponges into four great divisions or orders, to which, however, he does not as yet give definite names:—

I. Spicules of sexradiate type:—*Hexactinellidæ* and (extinct) *Ventriculitidæ*.

- II. Spicules anchor-shaped or of pyramidal type :—*Lithistidæ*, *Ancorinidæ*, *Geodinidæ*, and (extinct) *Vermiculatæ*.
- III. Spicules monaxial, polyaxial, or wanting :—*Halisarcinæ*—*Gummineæ*, *Ceraospongiæ*, *Chalinææ*, *Chalinopsidæ*, *Renierinæ*, *Suberitidæ*, *Desmacidinæ*.
- IV. Spicules calcareous :—*Calcispongiæ*.

The *Hexactinellidæ* are thus defined and subdivided by Kent (Month. Micr. J. Nov. 1870, p. 252) :—

Order *Hexactinellidæ*, O. Sdt. Sponges with a siliceo-fibrous or siliceo-spicular skeleton. Spicula of sexradiate-stellate type invariably present.

Suborder I. *Coralliospongiæ*, J. E. Gray. Sponge-body supported by an anastomosing or continuous reticulate skeleton. Reproductive gemmules entirely membranaceous, nonspiculous (?). Genera : *Euplectella*, *Habrodictyon*, *Aphrocallistes*, *Farrea*, *Aulodictyon*, *Macandrewia*, *Dactylocalyx*, *Fieldingia*.

Suborder II. *Calcispongiæ*, W. S. Kent. Sponge-body supported by an interlacing or isolated spicular skeleton, never by a reticulate and continuous one. Reproductive gemmules membranous, furnished with protective spicula (?). Genera : *Pheronema*, *Hyalonema*, *Askonema*, *Sympagella*, *Lanuginella*, *Vazella*.

Prof. E. PERCEVAL WRIGHT figures and describes an osculum of the sponge-mass of *Hyalonema mirabilis*, and the arrangement of spicules connected therewith (Q. J. Micr. Sc. 1870, p. 3).

Siliceæ.

Pheronema. Dr. Leidy figures (Am. Nat. March 1870) the sponge from Santa Cruz to which, in 1868, he gave the name of *Pheronema annæ*. *Pheronema*, Leidy, = *Holtenia*, Wyville Thomson (Kent, Ann. N. H. August 1870, p. 184; see also Zool. Rec. vol. vi. p. 679). *P. grayi*, sp. nov., Kent (l. c. pp. 182-186), Setubal, Portugal. Dr. Gray (l. c. p. 311) considers this to be generically distinct from *Pheronema*, having the filiform anchoring spicules (instead of being in tufts at the hinder end of the body) arising separately from all parts of the surface, except a small broad nude band round the oscule. Dr. Gray proposes for it the new generic name *Callisphæra*; but Professor Wyville Thomson (P. R. Soc. xix. p. 153) considers it only a variety of his *Holtenia carpenteri*.

Vazella, gen. nov., Gray (l. c. p. 311). To include *Holtenia pourtalesii* and *H. saccus*, O. Sdt.

Dr. GRAY proposes to form *Pheronema* and its allies into a new family, *Pheronemidæ* (l. c. p. 310).

Aphrocallistes bocagii, sp. nov., Perceval Wright (*ibid.* p. 4; see also Kent, M. Micr. J. Nov. 1870, p. 248, and O. Schmidt, Spongien des atlantischen Gebietes, p. 13), Atlantic, Cape-Verde Islands, 'Porcupine' Expedition, &c.

Askonema, g. n., Kent (M. Micr. J. 1870, p. 245). Sponge-body bag- or cup-shaped, of felt-like consistence, composed of an interlacement of long filiform siliceous fibres or spicula. Interspersed among these, hexradiate spicula of various sizes and minute multiradiate ones with capitate extremities. *A. setubalense*, coast of Portugal.

Aulodictyon, g. n., Kent (*ibid.* p. 249). In small fistulose ramifications; basal skeleton consisting of a complex reticulated tube, between and con-

tinuous with the primary meshes of which an abundant network of coalescing simple sexradiate stellate spicula occurs; among the spicules of the sarcodæ are remarkable long attenuate forms, others free sexradiate, and others spinulo-quadrifurcate-sexradiate-stellate. *A. woodwardi*, coast of Portugal; *A. fecundum* (O. Schmidt).

Fieldingia, g. n., Kent (Ann. N. H. (4) vi. p. 219). Sponge adherent, consisting of a cortex of irregular reticulated spicula (of a hexradiate type), having on its interior surface numerous reticulated laminæ of extremely delicate consistence; common cavity of the sponge containing numerous spherical aggregations of spicular reticulations, invested and brought into relation with the cortex by loose reticulated fibres of coarser structure. *F. lagettoideus*, off Cezimbra, Portugal.

Euplectella aspergillum described by Van der Burg (Tijd. Nederl. Ind. 1870).

Veluspa polymorpha, gen. et sp. nov., Miklucho-Maclay (Mém. Pétersb. 1870, p. 4), North Pacific. No generic diagnosis given. The following varieties show such great degrees of difference that, like the author's *Guancha blanca*, they might correspond to several genera, even orders, of the present system. *V. polymorpha*, varieties: 1. *gracilis*, 2. *digitata*, 3. *arctica*, 4. *repens*, 5. *gyriformis*, 6. *cribrosa*, 7. *flabelliformis*, 8. *infundibuliformis*, 9. *foliacea*, 10. *baicalensis* (= *Spongia baicalensis*, Gmelin, Georgi. Pallas, &c.).

Spuma borealis, sp. nov., M.-Maclay (ib. p. 13), North Pacific and Polar Seas. Varieties: 1. *papillosa*, 2. *convoluta*, 3. *tuberosa*, 4. *velamentosa*.

Euspongia brandti, sp. nov., M.-Maclay (op. cit. Mém. Pétersb. 1870, p. 15, Sea of Ochotsk).

Luffaria pyriformis, sp. nov., Duchass. l. c. p. 45, Bahamas.

Professor E. P. WRIGHT gives some observations on the structure of *Dehtella atrorubens*, Gray (Q. J. Micr. Sc. 1870, pp. 90, 91).

Raphidotheca, gen. nov., Kent (Ann. N. H. (4) vi. p. 218). Sponge incrusting, cavernous interiorly; entire external surface of cortex bristling with spinulate spicula, having their attenuate apices directed inwards, and mingling freely with the fascicles of simple acerate spicula which form upright supporting pillars to the roof; fascicles of smaller acerate spicula abundant in the sarcodæ of the cortex, and also distributed less frequently in the basal layer of sarcodæ, and in that investing the shafts or pillars; in the latter also minute spicula of the "palmato-inequianchorate" type (Bbk.). Oscula absent or indefinite. *R. marshall-halli*, sp. nov., Kent, off Cezimbra, Portugal.

Polyurella, gen. nov., Gray (l. c. p. 312). *P. schmidtii*, Gray, = *Tetilla polyura*, O. Sdt.

Wyvillethomsonia, gen. nov., Perceval Wright (loc. cit. p. 7). Sponge-body subspherical, attached by a stem, opposite to which at the summit is one large osculum, fringed by long delicate biacerate spicules. Interior of sponge-body consisting of several cavities, opening into the osculum. Stem prolonged through the body as an axis, and consisting of numerous biacerate spicules, mixed with which are a number of anchoring spicules (fusiformi-recurvo-ternate of Bowerbank), the recurved ends of which are always directed to the point of attachment. Spicules of the body furcated attenuato-patento-ternate (Bbk.), the radii of the ternate spicules meeting each other to form a remarkable loose network-like pattern on the surface of the sponge,

the long pointed process from the central boss projecting inwards towards the axis of the sponge. A thin sarcode-layer, abounding in stellate spicules, which vary much in size, covers the whole of the body and stem. One remarkable spicule (bifurcated expando-ternate) seems to terminate the axis in the centre of the large osculum. *W. wallichi*, dredged in 1913 fathoms, in lat. 58° 23' N., long. 48° 50' W.

Dorvillia agariciformis, gen. et sp. nov., Kent (M. Micr. J. 1870, p. 293), Brit. Mus.; locality unknown.

This is certainly the same as that described by Perceval Wright as *Wyville-thomsonia*, and is also very probably the species referred to by Bowerbank, 'Brit. Sponges,' vol. i. p. 22, as *Tethea muricata*, Bbk. MS. Bowerbank does not describe the species which Gray made into a genus, *Thenea* (P. Z. S. 1867, p. 541). The species should therefore stand as *Thenea wallichi* (E. P. Wright).

Tethyopsis columnifer, gen. et sp. nov., Stewart (Q. J. Micr. Sc. July 1870, p. 281), Philippine Islands.

Tethya atropurpurea, sp. n., Carter (Ann. N. H. (4) vi. p. 176), locality unknown.

Trachya, gen. nov., Carter (Ann. N. H. (4) vi. p. 178). Asperous, massive, cake-shaped, free or fixed, dense, rigid, osculiferous. Internally multinucleate. Spicules of two kinds only, viz. large and small; large spicule smooth, fusiform-acerate; small spicule, which is chiefly confined to the upper surface, smooth, fusiform-acuate. *T. permucleata*, sp. n., Vera Cruz.

The new genera and species of siliceous sponges described by O. SCHMIDT (Spong. Atlant.) are so numerous that the limits of the 'Record' hardly admit of a transcription of the generic diagnoses. We enumerate them below, arranged in the families now adopted by that author:—

I. HEXACTINELLIDÆ (= *Vitreæ*, Wyville Thomson, except some species of *Dactylocalyx* auctt.).

Lanuginella (g. n.) *pupa* (p. 13), Cape-Verde Islands.

Holtenia pourtalesi (p. 14), *H. saccus* (p. 15), Florida.

Sympagella (g. n.) *nux* (p. 15), Florida.

Placodictyon (g. n.) *cucumaria* (p. 16), Florida.

Farrea fecunda (p. 16), between Florida and Cuba.

Dactylocalyx crispus (p. 19), = *Myliusia callocyathus*, Gray (?).

II. LITHISTIDÆ.

Leiodermatium (g. n.). *L. ramosum* (p. 21), Florida; *L. lynceus* (p. 22), Portugal.

Corallistes (g. n.). *C. typus* (p. 22), = *Dactylocalyx prattii*, Bbk. (?), and *Macandrewia azorica*, Gray (?), Florida; *C. microtuberculatus* (p. 23), Cape-Verde Islands; *C. elegantior* (p. 23), Portugal; *C. noli-tangere* (p. 23), Portugal, Cape Verde; *C. clavatella* (p. 23), Florida; *C. polydiscus*, O. Sdt. (p. 24), = *Discoderma polydiscus*, Bocage; *Lygidium* (g. n.) *torquilla* (p. 84), Cuba, Cozera.

III. HALISARCINA—GUMMINEÆ.

Cellulophana (g. n.) *collectrix* (p. 25), Florida, Tortugas.

Columnitis (g. n.) *squamata* (p. 25), Antilles.

Chondrilla phyllodes (p. 26), Antilles.

IV. CERAOSPONGIÆ.

Stelospongos (g. n.) (p. 29), Antilles; species not named.

V. CHALINEÆ.

Pseudochalina, (g. n.) (p. 32), locality unknown; species not named.

Cacochalina subtilis (p. 33), Florida; *C. rubiginosa* (p. 33), Antilles.

Siphonochalina densa (p. 34), = *Reniera grayi*, Bocage (?), Portugal, Florida;
S. mollis (p. 34), Florida.

Sclerochalina cyathus (p. 35), Antilles.

Rhizochalina (g. n.) *oleracea* (p. 35), Antilles; *R. carotta* (p. 36), hab. — ?

Cribrochalina (g. n.) *infundibulum* (p. 36), = *Spongia hagenensis* and *bartholomæi*, Duch. & Mich. (?), Antilles; *C. cretacea* (p. 36), Florida.

Chalinula ovulum (p. 38), Greenland.

VI. RENIERINÆ.

Reniera ascidia and *R. hebes* (p. 40), Florida; *R. fortior* (p. 40), Antilles;
R. pons (p. 40), Denmark.

Amorphina genetrix (p. 41), Greenland; *A. terebrans* (p. 41), St. Thomas;
A. solidior (p. 41), Florida, Tortugas; *A. turritella* (p. 41), Florida.

Pellina (g. n.) (p. 41) = *Reniera semitubulosa*, Sdt.; *P. bibula* (p. 42),
Cattegat; *P. profunditatis* (p. 42), Florida.

Eumastia (g. n.) *sitiens* (p. 42), Greenland.

Foliolina (g. n.) *peltata* (p. 42), Florida.

Submidia aulopora (p. 44), = *Thalysias subtriangularis*, Duch. & Mich.,
West-India Islands, Florida; *S. muta* (p. 44), Florida.

Plicatella (g. n.) *aulopora* (p. 45), Florida.

Auletta (g. n.) *sycinularia* (p. 45), Florida.

VII. SUBERITIDÆ.

Suberites heros (p. 46), Antilles; *S. tuberculosus* (p. 46), Florida; *S. lobiceps*
(p. 47), Florida; *S. luetkeni* (p. 47), Denmark, Greenland; *S. arciger* (p. 47),
Greenland, Prøven.

Papillina cribrosa and *P. arenosa* (p. 48), Florida.

Radiella (g. n.) *sol* (p. 48), Cuba; *R. spinularia* (Bbk.).

Cometella (g. n.) *gracilior* (p. 49), Florida; *C. stellata* (p. 49), Cuba.
(*Hyalonema borealis*, Lovén, is probably a *Cometella*, its resemblance to *Hya-*
lonema being merely superficial, *ib.* p. 49.)

Thecophora (g. n.) *semisuberites* (p. 50), Greenland.

Rinalda (g. n.) *uberrima* (p. 51), Iceland.

Tethya repens (p. 51), Florida; *T. diploderma* (p. 52), Antilles.

VIII. DESMACIDINÆ.

Desmacella (g. n.) *pumilis* (p. 53), *D. vagabunda* (p. 53), Florida.

Desmacodes (g. n.) *subereus* (p. 54), Portugal.

Desmacidon titubans, *D. griseum*, and *D. dianae*, Florida; *D. tunicatum*
(p. 55), Florida and Portugal.

Tenacia (g. n.) *clathrata* (p. 56), Antilles, Florida.

Cribrella hospitalis (p. 56), Florida; *C. papillosa* (p. 57), Florida, Tortugas.

Esperta diaphana, *E. renieroides*, and *E. immitis* (p. 57), Florida.

Sceptrella (g. n.) *regalis* (p. 58), Florida.

IX. CHALINOPSIDINÆ.

Chalinopsis (g. n.) *cervicornis* (p. 60), Antilles; *C. conifera* (p. 60), Antilles; *C. clathrodes* (p. 60), Caracas.

Clathria rectangulosa (p. 60), Florida, Tortugas.

Azinella clava and *A. mastophora* (p. 61), Florida, Tortugas; *A. rugosa* (p. 61), Cuba, Cozera.

Phakellia folium and *P. tenax* (p. 62), Florida.

Raspailia (?) *hamata* (p. 62), West Indies.

Plocamia (g. n.) *gymnazusa* (p. 62), Florida; *P. clopetaria* (p. 62), Cuba, Cozera.

X. ANCORINIDÆ.

Pachastrella abyssi (p. 64) and *P. connectens* (p. 65), Florida.

Sphinctrella (g. n.) *horrida* (p. 65), Florida.

Tetilla polyura (p. 66).

Craniella (g. n.) *tethyoides* (p. 46), Florida, Iceland; *C. lens* and *C. insidiosa* (p. 67), Florida.

Ancorina sigmophora and *A. fibrosa* (p. 67), Florida; *A. individua* and *A. pachastrellioides* (pp. 67, 68), Antilles.

XI. GEODINIDÆ.

Geodia pergamentacea and *G. globus* (p. 69), Portugal; *G. simplex* (p. 70), Greenland; *G. thomsoni* (p. 70), Cuba, Cozera.

Pyxitis (p. 70), type *Geodia gibberosa* of authors.

Caminus (g. n.) *apiarium* (p. 71), Florida.

Calcareæ.

Häckel's "Prodromus of a System of the Calcareous Sponges" is translated in Ann. N. H. (4) v. pp. 176-191.

Baeria ochotensis, sp. nov., M.-Macley (Mém. Pétersb. 1870, p. 16), Sea of Ochotsk.

Nardoa reticulum, O. Sdt. (Sp. Atl. p. 73) = *Tarrus reticulatus*, Häckel; *Sycon raphanus*, O. Sdt. (ib. p. 74) = *Sycon arcticum*, Häckel; *Ute utriculus*, O. Sdt., = *Sycarium*, *Artynas*, *Sycocystes*, *Artinella utriculus*, H.

GREGARINIDA.

BENEDEN, E. VAN. On a new species of *Gregarina*, to be called *G. gigantea*. Q. J. Micr. Sc. Jan. 1870, pp. 51-59.

Gregarina gigantea, sp. n., E. van Beneden (l. c. p. 52). This species, inhabiting the intestines of the lobster, is remarkable for its large size, sometimes measuring not less than 16 millimetres in length. The author has made the remarkable observation of the successive appearance and disappearance of the nucleoli in the nucleus; and, as regards reproduction, he rejects the doctrine of the conjugation of two *Gregarinæ* in one cyst, but believes that the cysts themselves can multiply by division before giving rise to psorosperms. Mr. E. R. Lankester, in a note appended to the above paper (p. 58), though admitting that single *Gregarinæ* do become encysted, is still inclined to hold to the view that two are usually thus encased.

INFUSORIA.

CIENKOWSKI, Professor. Ueber Palmellaceen und einige Flagellaten. Arch. mikr. Anat. vi. pp. 421-438.

GIGLIOLI, E. H. La Fosforescenza del Mare. Note pelagiche ed osservazioni fatti durante un viaggio di circumnavigazione 1865-68, colla descrizione di due nuove Noctiluche. Atti Acc. Tor. 1870, pp. 485-505.

GREEFF, R. Untersuchungen über Protozoen. I. Ueber den Bau und die Fortpflanzung der Vorticellini. Verh. Ver. Rheinl. xxvii. pp. 194-198.

LANKESTER, E. RAY. Remarks on *Opalina* and its contractile vesicles, on *Pachydermon* and Annelidan Spermatophores. Q. J. Micr. Sc. 1870, pp. 143-150.

QUENNERSTEDT, A. Bidrag till Sveriges Infusorie-fauna.—I. Jemte en kort framställning af Infusionsdjurens organisation. Act. Lund. 1865. II. *op. cit.* 1867-68. III. *op. cit.* 1869-70.

The first of these papers contains an historical introduction to the study of Infusoria, a short exposition and *résumé* of their structure, and descriptions of forty-two known species. In No. 2 twenty-eight marine species occurring at Warberg are described, of which eleven are considered new by the author. In No. 3 a list of thirty Infusoria is given as observed in the sea at Wisby, Gothland; eleven are described, of which six are given as new.

TATEM, J. G. A contribution to the teratology of Infusoria. M. Micr. J. April 1870, pp. 194, 195.

——. Notes on new Infusoria. M. Micr. J. Dec. 1870, pp. 313, 314.

WRZESNIOWSKI, A. Beobachtungen über Infusorien aus der Umgebung von Warschau. Z. wiss. Zool. Bd. xx. 1870, pp. 467-512.

Researches commenced in the summer of 1865, and published in the Polish language in 'Jahrbücher der wissenschaftlichen Gesellschaft zu Krakau,' 35ter Bd. 1867.

GREEFF (*l. c.*) has made some most interesting observations on the integumentary, digestive, and reproductive systems of *Epistylis flavicans*, Ehr. He finds below the outer skin of most of these creatures certain pear-shaped or oval bodies, which he considers to be true trichocysts, and thinks that the staff-shaped bodies described as such in other Infusoria are neither trichocysts nor touch-corpuscles, but skeletal organs. Greeff has also observed in the same species an apparent distinction of sex, hair-shaped bodies like spermatozoa becoming developed in the

nucleus of some individuals, while in the nucleus of others rounded bodies were observed always increasing in number and finally in size. The nucleolus and nucleus therefore do not here stand to each other in the relation of male and female reproductive organs united in the same individual, as in other Infusoria. In those creatures (*Epistylis*) a triple, perhaps alternating mode of generation takes place, viz. :—1, longitudinal division ; 2, bud conjugation and embryo-formation ; 3, sexual generation by separate sexes.

Stentor barretti, sp. nov., Barrett [!] (M. Micr. J. April 1870).

Mr. J. G. TATEM describes (*loc. cit.* p. 194) monstrosities of *Trachelias anas* and *Chilodon cucullulus*, in which the "lip" or "brow" is inordinately prolonged. Also a variety of *Vorticella convallaria*, which he terms var. *monilata*, the body of the animal being ornamented by large transparent refractive beads arranged in equidistant rows. In the opinion that the transverse striations on the body of *V. convallaria* are, like the markings of a *Pleurosigma*, composed of closely dotted minute bead-like elevations of the surface, he supposes that these are here diminished in number but exaggerated in size. Mr. Tatem also describes, in the same journal for December 1870, a peculiar form of *Stylonychia pustulata*, in which the normally rounded posterior end of the body is prolonged into an extensile process or tail, terminating in a palmate expansion fringed with spines.

QUENNERSTEDT (Act. Lund. 1867-68) describes the following marine Infusoria as new, from the neighbourhood of Warberg, Sweden :—

Opalina mytili (p. 4), *Loxophyllum setigerum* (p. 6), *Lacrymaria versatilis* (p. 10), *Lagynus*, g. n. (type *Lacrymaria elegans*, Engelmann), *L. levis* (p. 12), *Trachelocerca tenuicollis* (p. 14), *Chænea* (g. n.) *vorax* (p. 15), *Paramœcium cucullio* (p. 18), *Metopides contorta* (p. 23), *Aspidisca sedigata* (p. 30), *Stylonychia similis* (p. 38), *Mitra radiosa* (p. 41).

The same author describes (Act. Lund. 1869-70) the following new species from Wisby, Isle of Gothland :—

Holophrya tarda (p. 8), *Panophrys fusca* (p. 9), *Lembus pusillus* (p. 16), *Aspidisca hexeris* (p. 19), *Oxytricha velox* (p. 20), *Trichodina baltica* (p. 24).

Of his list of 30 species of Infusoria from the sea at Gothland, Quennerstedt remarks that only about a third were hitherto known as exclusively belonging to salt water. Whether the 6 described as new are to be considered peculiarly marine cannot be settled as long as they are only known from that one spot amid such a preponderance of fresh- and brackish-water forms.

The following are the new species of Infusoria described by Wrzesniowski (*l. c.*) from the neighbourhood of Warsaw :—

Opercularia cylindrata (*l. c.* p. 468), *Cothurnia pusilla* (p. 471), *Oxytricha æruginea* (p. 471), *O. macrostyla* (p. 474), *Stichotricha aculeata* (p. 477), *Urostyla flavicans* (p. 480), if not identical with *Oxytricha urostyla*, Clap. and Lachm., *Euplotes patella*, var. *eurystomus* (p. 483), *Trochilia polonica* (p. 486).

Litonotus, g. n., Wrzesniowski (*l. c.*). Dorsal and ventral aspects differentiated, only the ventral set with short thin cilia. Body surrounded by a hyaline margin without granules, with a neck-like elongation, hyaline, flexible,

and retractile; mouth at base of neck on left margin; staff-shaped bodies present on left margin of neck. *L. fokium*, Wrzes., = *Dileptus fokium*, Duj., and *Loxophyllum fasciola*, Clap. & Lachm. pt.; *L. fasciola*, Wrzes., = *Amphileptus fasciola*, Ehr., and *Loxophyllum fasciola*, Clap. & Lachm. pt.; *L. warsaviensis*, sp. nov., Wrzes. (l. c. p. 502). Subgenus *Hemiophrys*, Wrzes. (l. c.). The granules and particles of nutriment extend themselves into the margins of the body; and the staff-shaped bodies are irregularly distributed on the dorsal and ventral surfaces. *Litonotus (Hemiophrys) diaphanus*, sp. nov. (P), Wrzes. (l. c. p. 503).

Microthorax pusillus, Engelmann. Wrzesniowski's examples from the neighbourhood of Warsaw differ from Engelmann's in two insignificant peculiarities only. In Engelmann's the body is more pointed in front, and on the ventral surface are three longitudinal grooves reaching only to the middle of the body.

Condylostoma (stagnale), sp. nov., Wrzes., if really different from *C. patens*, Duj.). This is a freshwater *Condylostoma*, the genus having hitherto been found only in salt water. It differs from *C. patens* in some points; but the author does not venture to set up a new species on the strength of a single example.

Dileptus gigas, Carus. Wrzesniowski (l. c.) describes two local varieties from the neighbourhood of Warsaw—*D. gigas grejecensis* and *D. gigas warsaviensis*.

Opalina. Mr. E. Ray Lankester (*loc. cit.*) describes the general structure and especially the contractile vesicles of *Opalina naidos*, Duj. According to the structure of their integument, nucleus, and contractile vesicles the *Opalinae* are to be considered true Infusoria, and not stages in the development of worms; but Mr. Lankester considers the organisms called by M. Claparède *Pachydermon* to be annelidan spermatophores.

GIGLIOLI (l. c. p. 491) describes two new species of *Noctiluca*: the first, *N. omogenea*, Gigl., from the Malay archipelago and Chinese seas, sheds a greenish light, wants the internal protoplasmic ramifications, and has its filament proportionally much shorter; the second, *N. pacifica*, Gigl., from the Pacific coasts of Australia and South America, shedding a whitish light, is larger than *N. miliaris*, and has, like it, the protoplasmic ramifications, but the filament is proportionally much longer and larger.

CZENKOWSKY'S researches (l. c.) lead him to the conclusion that the flagellate genera *Chlamydomonas*, *Euglena*, *Cryptomonas*, *Vacuolaria*, are naturally associated with the *Palmellaceae*.

Vacuolaria virescens, gen. et sp. nov., Cienk. (l. c. p. 426), from the Saxon Switzerland, possesses an oval body of naked protoplasm, coloured greenish by chlorophyll-granules, at one end two long flagella, likewise a nucleus, and between it and the attachment of the flagella 1-3 pulsating spaces. Their "zoospores" encase themselves in a covering of jelly, within which they lose their flagella, become spheroidal and multiply by division; there is, lastly, a condition of rest or encystment, in which the nucleus is not visible. *Colacium stentorinum*, Ehr., usually also reckoned a flagellate infusorian, agrees also in its course of development mainly with *Palmellaceae*.

Monas consociata, Fresenius, is referred by Cienkowsky to the genus *Phalansterium*, along with *P. intestinum*, sp. nov., Cienk. (l. c. p. 429). Both are numerous in Germany and Northern Russia. The development of these

organisms points to a close relationship with the *Palmellaceæ*; but the capability of the zoospores to take in solid nutriment leads us on the other hand towards the animal kingdom.

CZENKOWSKI describes, lastly, two other monad-like organisms whose development no longer accords with that of *Palmellaceæ*, but is remarkable for a peculiar *internal* cyst-formation.

Spumella vulgaris, gen. et sp. nov., Cienk. (*l. c.* p. 433). Zoospores colourless, globular or oval, attached by a stalk, and at the opposite pole provided with one long flagellum and two smaller ones on each side of the larger; a nucleus and one or two pulsating spaces. Solid nutriment taken in always at the base of the large cilium. Multiplies by division, also by budding. Encysting process peculiar, in that the cyst, globular with a little neck, arises *inside* the still moving zoospore.

Chromulina nebulosa, gen. et sp. nov., Cienk. (*l. c.* p. 435). Zoospores living associated in cloudy masses surrounding submerged objects, each egg-shaped, with one flagellum at the smaller end; a yellowish plate passes through the protoplasm body, from the attachment of the flagellum, along the wall, to about the middle, and then passes right across to the opposite side, where it again directs itself downwards. Pulsating spaces one or two. Ingestion of solid matters not observed. Cyst-formation internal; cyst globular, with a small neck. From peat-moss pools in Northern Russia.

CZENKOWSKI (*l. c.* p. 436) thus analyses the so-called *Flagellata*:—

1. Monads, including those forms without nucleus (*Monera*, Hæckel).
2. Palmellaceous Flagellata. Ex. *Euglena*, &c.
3. Flagellata with internal cyst-formation (*Entocystæ*, Cienk.). Ex. *Chromulina*, *Spumella*.

RHIZOPODA (including MONERA).

ALLMAN, G. J. Note on *Polytrema miniacea*. Ann. N. H. (4) v. pp. 372, 373.

ARCHER, W. On some Freshwater Rhizopoda, new or little known. Q. J. Micr. Sc. 1870, pp. 17–34, 102–124.

This forms the conclusion of Mr. Archer's "First Fasciculus" on Freshwater Rhizopoda, the new genera and species of which have been already noticed in Zool. Rec. vi. pp. 681–683. The present parts are principally occupied with the establishment of definite generic and specific characters for the Rhizopoda described, and with a review of the recent works of Greeff, Grenacher, and other authors on similar subjects.

——. On some Freshwater Rhizopoda, new or little known. Fasciculus ii. Proc. R. Irish Ac. Dec. 1870.

Contains descriptions of *Amphizonella vestita*, sp. nov., *Acanthocystis spinifera*, Greeff, and *Plagiophrys spherica*, Clap. et Lachm.

BRADY, H. B., PARKER, W. K., & JONES, T. R. A Monograph of the genus *Polymorphina*. Tr. L. Soc. xxvii. 1870, pp. 197–253.

- BRADY, H. B., & ROBERTSON, D. The Ostracoda and Foraminifera of tidal rivers. Ann. N. H. (4) vi. pp. 1-33, 273-309.

The Foraminifera are principally treated of in the second part of this work.

- CARTER, H. J. On two new species of the Foraminiferous genus *Squamulina*, and on a new species of *Diffugia*. Ann. N. H. (4) vi. pp. 309-326.

- On *Haliphysema ramulosa*, Bowerbank, and the sponge-spicules of *Polytrema*. Ann. N. H. (4) vi. pp. 389-392.

- DAWSON, G. W. On the Distribution of Foraminifera in the Gulf and River St. Lawrence. Canad. Nat. June 1870, pp. 172-180.

- GREEFF, R. Untersuchungen über Protozoen. II. Untersuchungen über Rhizopoden. 1. Ueber einen dem *Bathybius haeckelii* (Huxley) der Meerestiefen durch Vorkommen und Bau nahestehenden Organismus des süßen Wassers. 2. Ueber eine bei den Rhizopoden entdeckte wahrscheinlich geschlechtliche Fortpflanzung. Verh. Ver. Rheinl. xxvii. pp. 198 *et seq.*

- GRENACHER, H. Ueber *Actinophrys sol.* Ein Beitrag zur Kenntniss der Süßwasser-Radiolarien. Verh. Ges. Würzb. Neue Folge, i. pp. 166-178.

- HÄCKEL, E. Die Catallacten, eine neue Protisten-Gruppe. Jen. Z. Nat. vi. 1870, pp. 1-22.

- Nachträge zur Monographie der Moneren. *Ibid.* pp. 23-44.

In this paper 6 new species of Monera are described, and a table is also given of the hitherto described genera and species, with their localities.

- Beiträge zur Plastiden-Theorie. Jen. Z. Nat. Bd. v. 1870, pp. 492-550.—No. 1. Die Plastiden-Theorie und die Zellen-Theorie. No. 2. *Bathybius* und das freie Protoplasma der Meerestiefen. No. 3. *Mycobrachia* von Langerote. No. 4. Die Plastiden und das Protoplasma der Rhizopoden. No. 5. *Amylum* in den gelben Zellen der Radiolarien. No. 6. Die Identität der Flimmerbewegung und der Amœboiden Protoplasmabewegung. No. 7. Die Plastiden-Theorie und die Kohlenstoff-Theorie.

JONES, T. R. (See BRADY, H. B.)

PARKER, W. K. (See BRADY, H. B.)

ROBERTSON, D. (See BRADY, H. B.)

Greeff notices (*l. c.*) a probably sexual mode of generation in an *Amoeba* from Poppelsdorf. The germs of the brood appear in the cavity of the nucleus, close to which the author found, in the same individual, several oval capsules containing hair-like bodies corresponding to those which we find in the nucleoli of Infusoria. Greeff suggests that probably such a sexual differentiation exists also in the Polythalamia and Radiolaria, reestablishing the claim of the Rhizopoda to be considered as true animals and not as "Protista."

Diffugia ligata, sp. nov., Tatem (M. Micr. J. Dec. 1870, p. 313); *D. bipes*, sp. nov., Carter (Ann. N. H. May 1870, p. 323), Budleigh-Salterton. In both of these new species the body is fixed by three sarcodal filaments to the posterior part of the test.

Amphizonella vestita, sp. nov., Archer (Proc. R. Irish Ac. Dec. 12th, 1870), counties Westmeath and Tipperary. As Greeff, who established the genus, did not give any special diagnosis of it, the following is supplied by Mr. Archer:—Genus *Amphizonella*, Greeff. Rhizopod with a nucleated body-mass, enclosed in a distinct (and separable), more or less pellucid, elastic, and yielding investment, through which it temporarily protrudes a greater or less number of digitate or tapering short hyaline pseudopodia, upon the retraction of which the extemporized openings in the investment become effaced by virtue of its inherent fusibility.

ARCHER describes (Proc. R. Irish Ac. Dec. 12th, 1870) a form, in two varieties, which he supposes may be identical with *Plagiophrys spherica*, Clap. & Lachm. He points out, however, the presence of a distinct test, of tree-like instead of Actinophryan pseudopodia, as figured by Claparède and Lachmann, and of a distinct internal "nucleus."

GRENACHER (*l. c.*) has observed in the centre of *Actinophrys sol* a little vesicular body about one-fourth to one-fifth of the diameter of the entire organism, which he considers equivalent to the "central capsule" of the marine Radiolaria; indeed it would be quite the same structure were the microscope to demonstrate an unquestionable membrane for it. The central axes of the pseudopodia may be traced to the outer wall or surface of this vesicle. Regarding the question of placing the Actinophryans among the Radiolaria, the author refers to the similar relations of the pseudopodia to the extracapsular sarcode, and to the resemblance of the spicular skeleton of *Acanthocystis* to similar structures in Radiolaria. Even the want of a central capsule would not absolutely shut them out from Radiolaria, as *Coccinosphæra*, Stuart, has none; and the same is to be said as regards the absence of "yellow cells," as these are wanting in the Acanthometridæ. The contractile vacuole is the only "veto" against the union of *Actinophrys sol* with the Radiolaria. Regarding this contractile vacuole, Grenacher is not inclined to accept it as an organ of special nature, but thinks rather that any vacuole at the surface may become contractile. The author likewise asks if the "cells" of *Actinophrys* (*Actinosphærium*) *eichhorni* may not possibly be the homologues of the central capsule in *A. sol*. If so, then *A. eichhorni* is one of the Radiolaria Polyzoa.

ARCHER likewise notices in a large green Actinophryan (species undetermined) a clear spherical body occupying the centre of the body-mass, which seems to be a veritable central capsule. He also witnessed the evolution of minute biciliated greenish zoospores from the body of the Actino-

phryan without any previous encysted condition (Q. J. Micr. Sc. July 1870, pp. 306, 307).

J. G. WALLER has some observations on the conjugation of *Actinophrys sol.* J. Quek. Micr. Club, 1870, pp. 93-98.

Acanthocystis spinifera, Greeff, recorded by ARCHER from Tipperary (Proc. R. Irish Ac. Dec. 12, 1870). In the centre of the presumed central capsule Archer figures a minute round body, deeply taked on the carmine dye, and which he considers may be the "vesicula intima." The same structures were observed in *A. pertyana*, Archer, in which he had previously failed to make out a central capsule; but in this case the central capsule took on the dye as well as did the inner vesicle. *A. spinifera* was observed in conjugation; the yellow globules seen in this species are regarded by Mr. Archer as oil-globules.

After examination of several Radiolaria, collected partly in Messina and partly in the Canary Islands (*Thalassicolla pelagica*, *Collozoum inerme*, 4 species of *Sphaerouzoum*, *Raphidozoum acuferum*, and *Collosphæra huxleyi*), Häckel finds that certain granules in their yellow cells are coloured blue by iodine, and are therefore starch. According to Müller, the yellow cells only became dark brown when treated with iodine. Häckel explains this by supposing that the magnifying-power used was not strong enough (it must be at least 700 diam.), so that the intense yellow of the remaining protoplasm disguised the blue of the starch-granules. (Jen. Z. Nat. v. 1870, pp. 492-550.)

Myxobrachia, g. n., Häckel (Jen. Z. Nat. v. 1870, pp. 492-550). Central capsule globular, with vesicula intima. Extracapsular sarcode prolonged into 1 or more depending arm-like processes, whose button-shaped ends enclose collections of calcareous spicules or concretions. Central capsule excentric, in the pear-shaped mass of alveoles, which is swollen towards the upperside of the sarcode body. Yellow cells numerous around the central capsule, and traversing the arms in a row. *M. pluteus*, sp. nov., Häckel (*l. c.*), arms as many as 16; *M. rhopalum*, sp. nov., Häckel (*l. c.*), with only one arm. Both from Lanzarote. This singular genus of Radiolaria owes its interest to the calcareous bodies contained in the terminations of its arms, and which greatly resemble the well-known corcoliths and coccospheres of the Atlantic sea-bottom; but unfortunately Häckel neglected to determine the question of their identity beyond doubt. If they are identical, Häckel asks, How do they get to the surface of the water, seeing that the *Myxobrachia* floats? for it is very improbable that the great masses of corcoliths and coccospheres at the bottom of the Atlantic should be only the spicules of pelagic Radiolaria sunk to the bottom after the death of the creatures which formed them.

Thalassicolla sanguinolenta, sp. nov., Häckel (*ib.* p. 526), Lanzarote. Very like *Myxobrachia*, but has no arms.

In CARPENTER, JEFFREYS, and W. THOMSON's Report on the 'Porcupine' Expedition of 1869 (Proc. R. Soc. xviii. pp. 397-492) frequent mention is made of Foraminifera and also of Polycystina. In the warmer parts of the areas dredged in the three cruises Foraminifera were, as before, extremely numerous, a large proportion being arenaceous.

Mention is made (p. 421) of a peculiarly interesting *Orbitolites* (*O. tenuissimus*, sp. nov., Carp. P. R. Soc. xix. p. 155) dredged from 1443 fathoms depth, off the N.W. coast of Ireland, a type not hitherto discovered north of

the Mediterranean. A peculiar flexible Rhizopod, with a chitinous cortex, studded with Globigerina, and enclosing an olive-green sarcod, is recorded from off the S.W. coast of Ireland in 2435 fathoms water. In the "Cold Area" between Scotland and the Færoes the Globigerina-mud is entirely wanting; and, with the exception of certain arenaceous types, Foraminifera are not here conspicuous either for number or variety. One of these arenaceous types forms Dr. Carpenter's new genus *Botellina* (*ib.* p. 444). Tubes $\frac{3}{4}$ to 1 inch long, like straight *Lituola* externally; but the cavity continuous throughout, though traversed in every part of its length by irregular processes, built up partly of sand-grains, partly of sponge-spicules. Sarcodic body filling the whole of the cavity, which communicates with the external medium by irregular apertures at one end of the tube (free?), the other extremity (attached?) being uniformly open in the specimens obtained. Dredged in 440 fathoms at a station intermediate between the warm and cold areas.

The same authors (p. 478) support the view that the Protozoic portion of the Deep-sea Fauna is nourished by direct absorption of organic matter diffused through the whole mass of the oceanic water.

> *Squamulina scopula*, sp. nov., Carter (Ann. N. H. (4) v. p. 309), Budleigh-Salterton, Devon; *S. varians*, sp. nov., Carter (*ib.* p. 321), same locality. Both these species are arenaceous, and have, besides siliceous grains, sponge-spicules entering into the formation of their test. *S. scopula*, bearing on its discoidal base a column, brush-like with attached sponge-spicules, is the same as *Haliphysema tumanowiczii* of Bowerbank, described by that author as the smallest British sponge. *H. ramulosa*, Bbk., Carter regards as probably a branched variety of the same rhizopod (*ib.* June 1870, p. 390). The same author's subsequent observations (*ib.* Oct. 1870, pp. 346, 347) confirm his views both that *Squamulina scopula* is a foraminiferous animal, and that *Haliphysema ramulosa*, Bbk., is a variety of it. After cutting off the branched head of the latter variety he observed the protrusion and retraction of branching and anastomosing pseudopodia, with circulation of granules.

CARTER describes the sponge-spicules found in connexion with the test of *Polytrema* (*ib.* pp. 391, 392). Allman states that, although he has seen siliceous spicules resembling those of sponges in the interior of the chambers of *Polytrema miniacea*, in many specimens he could find no trace of them (Ann. N. H. (4) v. p. 373).

Messrs. BRADY, PARKER, and JONES, in their monograph of the genus *Polymorphina*, enumerate and describe forty-one recent and fossil species, including three belonging to the subgenus *Dimorphina*. Read in the light of the older definitions the whole of these must really be regarded as a single "species," as from end to end of the series there is no single break. No less than twenty-four generic synonyms are quoted (Trans. Linn. Soc. xxvii. pp. 197-253).

Polymorphina hirsuta, sp. nov., Brady, Parker, and Jones (*l. c.* p. 243), fossil, from the Crag, Colchester.

Brackish-water Foraminifera. In Mr. H. B. Brady's "Analysis" (Ann. N. H. (4) vi. pp. 273-309) a table is given showing the results of gatherings from thirty-two brackish localities, all British, save one from the Scheldt near Antwerp. An additional column collates the results of Messrs. Parker and Jones's fen-clay investigations. Of forty-four reputed genera found in the British seas only twelve are entirely absent, viz. *Hauerina*, *Sac-*

cammina, *Valvulina*, *Lingulina*, *Spirillina*, *Bigenerina*, *Cassidulina*, *Anomalina*, *Tinoporus*, *Nubecularia*, *Operculina*, and *Nummulina*. Two new forms are very common, viz. *Quinquiloculina fusca*, sp. nov., H. B. Brady (*ib.* p. 286), = *Q. agglutinans*, H. B. Brady (1865), and *Trochammina inflata*, var. *macrescens*, var. nov., H. B. Brady (*ib.* p. 290). Several species occur not previously recorded from British localities, viz. *Quinquiloculina candeiana*, D'Orb., *Dentalina guttifera*, D'Orb., *Textularia globulosa*, Ehr., *Gaudryina pupoides*, D'Orb., *Verneuilina spinulosa*, Reuss, *Bolivina plicata*, D'Orb. One effect of brackish conditions seems to be a diminution of the calcareous matter in the tests; the brackish-water specimens are mostly smaller and thin-shelled, Miliolida (e. g. *Quinquiloculina fusca*) and Lituolida (e. g. *Trochammina inflata*) becoming sometimes keratose. Some show a green tint, as *Polystomella striatipunctata* and *Nonionina depressula*.

Mr. G. W. DAWSON gives a short account of the distribution of Foraminifera in the Gulf and River St. Lawrence, with a table showing the results, as to distribution, of twenty-three gatherings from those waters and neighbouring parts of the Atlantic. (*Canad. Nat.* June 1870, pp. 172-180.)

ARCHER (Q. J. Micr. Sc. July 1870, p. 303) notices a freshwater organism from Ireland, closely resembling Cienkowski's genus *Labyrinthula*, from which, however, it differs in several particulars. Mr. Archer does not as yet apply a name to this form, which if not a Labyrinthulean, is at all events a perfectly distinct and novel freshwater rhizopod.

GREEFF (*l. c.*) announces the discovery in fresh water near Poppelsdorf of a rhizopod analogous to the marine *Bathybius*. It consists of globules of sarcode existing in immense quantity, and never disappearing at any season from the pond where it occurs. The sarcode, of irregularly vacuolate consistency, contains numerous bodies derived from without, such as shells of *Diffugia*, *Arcelle*, and *Diatomaceæ*. It also contains peculiar round or oval nuclear bodies and fine staff-shaped structures; most of the former have no definite structure, and resist the action of acids and alkalis, and may, in the opinion of the author, be compared to coccoliths. There are also softer bodies comparable to cell-nuclei; therefore this rhizopod is not a *Moneron* like *Bathybius*, but a multicellular organism. To this organism Greeff applies the generic name *Pelobius**, and promises a more minute account of it.

A minute account of *Bathybius*, and of the associated cyatholiths, disco-liths, and coccospheres, is given by Hæckel (*Jen. Z. Nat.* v. 1870, pp. 492-550). *Bathybius*, according to Hæckel, is a *Moneron*. That the Coccoliths and coccospheres are produced by it, is, he thinks, probable, but not yet fully made out; and here he refers to the singular concretions found in the arms of the Radiolarian *Myxobrachia* (chronicled above). He also enters into the difficult questions connected with the nourishment and reproduction of *Bathybius* and other elementary forms of life at great depths.

Magosphæra planula is the name given by Hæckel to a new microscopic organism which he found attached to marine conferva (*Cladophora*) on the Norwegian coast. The stages of its life-history, through which Hæckel has traced it, are as follows:—1st. The encysted stage, in which the organism constitutes a globular cell with nucleus and nucleolus, and closely resembles an ovum. 2nd. The stage of cleavage, in which the nucleus and cell-contents multiply by division into as many as thirty-two daughter-cells.

* [Preoccupied in Coleoptera.—ED.]

3rd. The volvocine stage, in which the daughter-cells escape from the parent cyst, but still cohere together in a ciliated globe, the cilia being developed on the external surfaces of the component cells. 4th. The peritrichal stage, in which the ciliated globe breaks up into its constituent cells, which, swimming away, closely resemble peritrichal infusoria in general appearance. 5th. The Amœba stage, in which the individual cells sink to the bottom, retract their cilia, and in their place protrude bundles of pointed pseudopodia. Development supposed to begin again by the encystment of the Amœbæ; but this was not directly observed. In all stages, each cell-element of the *Magosphæra* possesses a nucleus; and in the volvocine, peritrichal and amœboid stages, likewise a contractile vacuole. For this organism Hæckel provisionally frames a new division, *Catallacta*, of his kingdom of *Protista* (Jen. Z. Nat. vi. 1870, pp. 1-22).

Vampyrella gomphonematis, sp. nov., Hæckel (Jen. Z. Nat. Bd. vi. p. 23), Bergen; *Protomonas huxleyi*, sp. nov., Hæckel (ib. p. 29), Bergen; *Protamœba simplex*, sp. nov., Hæckel (ib. p. 32), Jens; *P. agilis*, sp. nov., Hæckel (ib. p. 33), *P. polypodia*, sp. nov., Hæckel (ib. p. 34), Bergen, = *Amœba polypodia*, Schulze (?).

HÆCKEL writes likewise on the identity of ciliary and amœboid protoplasmic movement, considering the former to be only a definite modification of the latter. When the swarm-spores of *Protomyxa aurantiaca* and *Protomonas huxleyi* settle down into amœboid bodies their flagella become pseudopods; and Hæckel observed the same process to take place in a flagellate sponge-particle from *Leucosolenia*. The passage of amœboid processes into cilia, on the other hand, was first observed by Hæckel in the ova of *Siphonophora*, and again in the course of development of the singular organism *Magosphæra*. (Jen. Z. Nat. 1870, v. pp. 492-550.)

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END OF THE SEVENTH VOLUME.

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ZOOLOGICAL RECORD
V. 7, 1870

| NAME | DATE |
|-------------------|----------|
| J. E. Chamberlain | 1/27/21 |
| W. H. Chamberlain | 2/28/24 |
| W. H. Chamberlain | 5-28-24 |
| W. H. Chamberlain | 10-23-26 |
| H. H. Chamberlain | 10-29-24 |
| W. H. Chamberlain | 11-19-25 |
| W. H. Chamberlain | 11-19-25 |
| W. H. Chamberlain | 11-19-25 |

